Engin.
Forum

GENERAL INDEX.

(Illustrated Subjects are Marked with an Asterisk after the Number of the Page.)

A.

ABELL, Prof. T. B., on Mechanism of Ship's Wake, 469
Absalom *versus* Great Western Garden Villages Society, Ltd., 547
Accidents :
Accidents in Mines, 164
— in Ships Caused by Structural Details, 111
Children and Dangerous Machinery, 626
Explosion, Boiler. See *Boiler Explosion* and PARAGRAPH INDEX
— of Neunkirchen Gasholder, 282, 390*. See LETTER, 389
Failures of Prime Movers and Boiler Plant, 488*, 496, 554*, 582, 661*. See *Erratum*, 596
Fires from Celluloid, 654
Machinery Failures due to Sharp Corners, 451*
National "Safety First" Association, Work of, 574
Neunkirchen Gasholder Explosion, 282, 390*. See LETTER, 389
Shipping, Fire on S.S. "L'Atlantique," 49
Accumulators, Electric. See *Electric*
Acetylene Generators (C. S. Milne & Co., Ltd.), 353*
— Welding. See *Welding*
Acid Separators, Coke-Oven and Recovery Plant, Irlam, 540*
— Tanks for Wire Cleaning, Working of, 609
Acoustics Laboratory, Metropolitan-Vickers Electrical Co., Ltd., 563*
— Sounding Plates and Sensitive Flames, 523
Acropolis, Athens, Floodlighting of, 357
Acton, North, Electrically-Welded Building, 444
Adam, J. L., on Electric Arc Welding in Ship Construction, 359
Address, Presidential. See *Presidential Address*
Adiabatic Lapse-Rate for Dry and Saturated Air, 652
Advertisement Matter, Taxation of, Memorandum on, 627
A.E.G.-Segler Threshing Machine, 671*
Aerodynamics. See *Aeronautics*
Aeronautics :
Aerodromes, Construction of, 329
— Grounds, Treatment with "Terolas," 653*
— Lighting, Standardisation of, 105
— Portable Floodlight for (Chance Brothers & Co., Ltd.), 661*
Aerodynamics, Treatise on (Review), 4
— Department, National Physical Laboratory, Compressed-Air Wind Tunnel, 309
Aeronautical Laboratory, Cambridge University Engineering Department, 118
— Research Committee, Report, 76
Aeroplanes, Mechanics of (Review), 4
Air Ministry, Petrol from Coal for, 361
Aircraft Materials, Corrosion-Fatigue Tests of, 542
Busk Studentship in Aeronautics, 622
Engines, Aeroplane, Research Work on, 76
— Petrol, Aeroplane, Steels for Valves of, 55*, 83*
— — Aeroplane, 425-b.h.p. Six-Cylinder Junker, 527
Instruments, Aircraft (H. Hughes & Son, Ltd.), 97
Royal Air Force, Modifications in Organisation, 19
— Aircraft Establishment, Research Work at, 76
Spinning of Aeroplanes, Researches on, 76
Wind Tunnel, Compressed-Air, at National Physical Laboratory, 309
— — Experiments on Motor-Car Models, 521
See also PARAGRAPH INDEX
Aeroplanes. See *Aeronautics*
Africa, Portuguese East, Economic Conditions in, Report, 674
Agile (London), Ltd., Electrically-Welded Building, 444
Agreements, Labour. See *Labour*
Agricultural Hall. See *Exhibition*
— Machinery Industry, Position and Prospects, 561
— Motors. See *Engines ; Motors ; Tractors*
— Show, German National, Berlin, 670*
— Society, Royal, Derby Show, 698*
— Tractors. See *Tractors*
Agriculture. See also *Irrigation* and PARAGRAPH INDEX
Ailsa Craig Motor Co., High-Speed Diesel Engines, 262
Air, Compressed. See *Compressed Air*
— Compressors, Automatic Pressure Release for (B.E.N. Patents, Ltd.), 246*
— — Electrically-Driven (Reavell & Co., Ltd.), 236*
— — Petrol-Driven, Portable (Lead Wool Co., Ltd.), 367*
— — Turbo-, Two-Stage (Spencer Turbine Co.) 39*
— — See also *Gas Compressor*
— Dry and Saturated, Adiabatic Lapse-Rate for, 652
— Ejectors, Production of Vacuum by, 230*, 255*, 262*
— Filter, Drawer-Type (C. G. Vokes, Ltd.), 244*
— Flow Measurement, Standard Nozzles for, 686
— — in Pipes, Apparatus for Observing Turbulence, 602
— Heaters, "Usco" Type, New Blackburn Meadows Power Station, 457
— Intrusion into Anticyclones, 637
— Ministry, Petrol from Coal for, 361
— Pump. See *Pump*
— Resistance of Motor-Cars, 521
Aircraft. See *Aeronautics*
Aitken, I. M. E., on Drainage of Georgetown, British Guiana, 417
Aiton, Ltd., 26-in. Steam Pipe for High Pressures, New Blackburn Meadows Power Station, 701*
Albany, New York, Self-Supporting Arc-Welded Steel Roof, 22*
"Albert Ballin," S.S., Furnace Water-Walls in Boilers of, 12*
Alberta, Research Council of, Report, 146
Alexander, Prof. T., the Late, 287
Aliquippa Steel Works, Blast Furnace at, 501*
Allcock, G. T., on Electricity in Civil Engineering, 692
Allday, W., & Co., Ltd., Gas Heater for Tools, 246*
Alldays & Onions, Ltd., Oil-Fired Heat-Treatment Furnace, 186
Allen, N. P., on Porosity of Copper Ingots, 362 ; on Reaction between Steam and Molten Copper, 365 ; on Effects of Hydrogen and Oxygen on Copper-Nickel Alloys, 363
Allgemeine Elektricitäts Gesellschaft, High-Duty Spot-Welding Machines, 504* ; Motor-Driven Circular Saw, 671* ; Electric Cables for Soil Heating, 671*
Allin, R. V., on Foundations and Tunnels at Ford Motor Works, 169
Allott, C. L., and Son, Battersea Power Station, 89*, 153*
Alloys. See *Metallurgy ; Microphotographs ;* PARAGRAPH INDEX
Alluvial-Matter Eliminators for Hydraulic-Turbine Water Supplies, 480
Alternating Current. See *Electric*
— Stress. See *Tests (Materials)*
Alternators. See *Generators, Electric ; Turbo-Generators*
Aluminium Alloys. See *Alloys* under *Metallurgy*
— Foil as Heat Insulating Material, 536
— Heat Treatment and Annealing of (Review), 614
— Industry in Scotland, 592*, 628, 633*
— Production Plant, River Niva, Russia, 430
— Wire, Conductivity of, 327, 473*
— See also *Metallurgy ; Metal-Price Diagrams*
American Bridges, Early, Evolution of, 389
— Railways, Express Train Speeds on, 459
American Gas and Electric Co., Tests of Circuit-Breakers, 8*
— Navy. See *United States* under *Warships*
— Society of Mechanical Engineers. See *Mechanical Engineers*
— Society of Naval Architects and Marine Engineers. See *Naval Architects*
— See also *United States*
Ammonia Compressors, Four-Cylinder, Grimsby Fish-Dock Ice-Making Plant, 647*
— Recovery Plant, Coke-Oven Plant, Irlam, 540*
Ammoniacal Liquor Distillation, Effluent from, 386
Ammonium Sulphate, Effect of Impurities on Crystallisation of, 603
Amsler, A. J., & Co., Static and Dynamic Testing Apparatus, 432*
Andrade, Prof. E. N. da C., on Sounding Plates and Sensitive Flames, 523
Anglo-Palestine Exhibition, 654
— Russian Economic Society, Pamphlet on Russian Trade, 361
Annealing. See *Heat Treatment* under *Metallurgy*
Annuals and Reference Books, 20, 175, 365, 391, 473, 660, 687, 713. See LITERATURE INDEX
Anticyclones, Air Intrusion into, 637
Anti-Friction Metals. See *Alloys* under *Metallurgy*
Antimony Alloys. See *Alloys* under *Metallurgy*
— Prices. See *Metal-Price Diagrams*
Apatite Deposits, Kola Peninsula, Russia, 430
Apparatus, Scientific, Exhibition, Royal Society Conversazione, 566*, 591*, 602*
— — Historical, Ashmolean Museum, Oxford, 533*
— — Physical Society's Exhibition, 49*, 77*, 94*, 166*, 261*
Appointments. See PARAGRAPH INDEX
Arbitration in Building and Engineering Contracts, 547
Arc. See *Electric ; Furnace ; Welding*
"Arcform" Form of Ship Construction, 514
Arch, Furnace, Refractories for, 35
— Limestone Block, Paris Metropolitan Railway, 62*
Architects, Naval. See *Naval Architects*
Architecture and Structural Engineering, 334
Areas, New Rules for, 508*
Argentina, Bahia Blanca, 80,000-ton Granary, 147*, 205*, 267
Argentine State Railways, 2-8-2 Type Condensing Locomotive, 517*
Armco Iron Chimneys, New Blackburn Meadows Power Station, 457
"Armour-Plate" Glass, Properties and Manufacture of, 527
Armstrong, Sir W. G., Whitworth & Co. (Engineers), Ltd., 3½-cwt. Semi-Rotary Oil-Fired Melting Furnace, 183* ; 250-h.p. Diesel-Electric Express Rail Coach, 255, 330. See 281. See LETTERS, 209, 338 ; 1,700-h.p. Oil-Electric Mobile Power Houses, 328* ; 1,700-h.p. Diesel-Electric Locomotive, 328
Arrol, Sir W., & Co., Ltd., Battersea Power Station, 89*, 152*. See 585*, 667*
Arsenic, Effect on Copper, 665
Art, British, in Industry, Royal Academy Exhibition of, 387
Arts, Royal Society of, Railway Electrification in India, by F. Lydall, 133 ; Natural Steam Springs of Tuscany and their Industrial Application, by Prince G. Conti, 522 ; Howard Lectures on Thermal Insulation, by Dr. E. Griffiths, 536
— Scottish Society of, Trend of Modern Engineering, by Dr. R. Lessing, 165
Ash-Handling Plant, Battersea Power Station, 90*
— — Plant, Dunston Power Station, 156
— — Plant, New Blackburn Meadows Power Station, 457*
Ashmolean Museum, Oxford, Historical Scientific Instruments at, 533*
Ashmore, Benson, Pease & Co., Ltd., Pipe Lines, Sivasamudram Hydro-Electric Scheme, 3* ; Fista Transmission-Line Poles, 273*
Askam, J. F., Oil-Fired Brass Billet Furnace, 184*
Askwith, R., the Late, 365
Asphalte, Natural, Specification, 79
Asquith, J. G., the Late, 570
Asquith, J. W. S., the Late, 417
Association, British. See *British Association*
— Engineering. See *Institutions*
Astrolabes at Asmolean Museum, Oxford, 534*
Astronomical Instruments, Historical, at Ashmolean Museum, Oxford, 533*
Athens, Floodlighting of Acropolis, 357
Atlantic Liners. See *Steamers*
Atmospheric Pollution Research Committee, Annual Report, 493
Atomic Physics, Advances in (Review), 295
— Transmutations, 348
Atritor Pulveriser, Motor-Driven (A. Herbert, Ltd.), 242*
ATV Turbine Blading, 289*
Augmenter, Vacuum, Invention of, 230
Augusta', Ltd., Core-Blowing Machine, 486*
Australia, New South Wales Public Works Department, Annual Report, 438
— Report on River Murray Works, 361
— South, Report on Railways, 386
— Sydney Harbour Bridge, Souvenir of, 430
Australia, Sydney Harbour, Timber Destruction by Marine Organisms, 104
— Wonthaggi Colliery, 102
Austrian Federal Railways, Electrification of, 232
Autocontrol Boilers, Ltd., Gas-Fired Boiler, 515*
Autogenous Welding. See *Welds* and *Welding*
Automatenwerk Stelmhäuser, Seven-Tool Automatic Lathe, 294* ; Slotting and Face-Milling Machine, 451*
Automatic Electric Co., Ltd., Electro-Matic System of Traffic Control, 388* ; Traffic Control System, Piccadilly, 596
— Machine Tools. See *Machine Tools*
— Signalling. See *Signalling*
— Stokers. See *Stokers*
Automobile Engineers, Institution of, Observations on Petrol and Diesel Engines, by H. R. Ricardo, 308. See LETTER, 209* ; Investigation of Flow in Oil-Engine Injection Systems, by Dr S. J. Davies and Dr. E. Giffen, 715*
— See *Motors Cars*
Automotive Engineers, American Society of, Papers on Tests of Motor Fuels, 465 ; Researches on Air-Resistance of Motor Cars, 521
Auxiliary Machinery, Marine. See *Marine*
Aveling & Porter, Ltd., Development of Traction Engines by, 639* ; Early Steam Road Rollers, 642*
Avery, W. & T., Ltd., Dual-Ratio Counting Machine, 244* ; 500-ton Self-Indicating Compression Testing Machine, 176* ; 12,000-lb. Automatic Grain-Weighing Machine, 568*. See 136, 141*, 199*
Aviation. See *Aeronautics*
Axien Flexible Coupling, 247*
Axles, Investigation of Failures of, 496, 583

B.

BABCOCK & WILCOX, Exhibits at New York Power Show, 39
Babcock & Wilcox, Ltd., Boiler Plant, Battersea Power Station, 90* ; Experimental Water-Tube Boiler, 334 ; Exhibits at British Industries Fair, 209 ; Waste-Heat Boiler for Cement Kiln, 616*
Baclé, L., on Open-Hearth Basic Steel Process, 172
Bacon, Prof. F., Investigations on Fractured Shafts, 685*
Badger, E. B., & Sons Co., Expansion Joint, 195
Bagger, Sulphate, Coke-Oven and Recovery Plant, Irlam, 540*
Bahia Blanca, 80,000-ton Granary, 147*, 205*, 267*
Bailey Meter Co., Three-Element Feed-Water Regulator, 672*
Baird & Tatlock (London), Ltd., Mortar and Pestle, 96
Balances, Chemical (L. Oertling, Ltd.), 78
— Pressure, for High Pressures, 172*
— Spring (G. Salter & Co., Ltd.), 245
Ball Bearings. See *Bearings*
— Hardness Tests. See *Hardness* under *Tests (Materials)*
Baltic and International Maritime Conference, Proposed Rationalisation of Shipping Tonnage, 438
Band Conveyors. See *Conveyors*
— Saws. See *Saws* under *Machine Tools*
Banhida Power Station, Hungarian State Railways, 58*
Barber, S., on Lighting at the Coal Face, 619
Barford & Perkins, Ltd., Petrol-Driven Road Rollers, 212*
Barker, A. H., on Heating Buildings by Gas, 618
Barrage, Severn, Report, 307, 394*, 599
Barrel, Plating (W. Canning & Co., Ltd.), 270*
Basic Steel Process in France, Jubilee of, 171. See 488, 674
Batey, J. T., on Improved Forms of Cargo Steamers, 393*. See 415
Batteries. See *Electric*
Battersea Power Station, 89*, 152* ; Emission of Fumes, 361 ; 67,200-kW Turbo-Alternators, 585*, 667*
Battleships. See *Warships*
Bauxite Ore for Aluminium Production, 592, 628
Bayer Process of Aluminium Production, 592*
Beacham, T. E., and Dr. H. S. Hele-Shaw, Hydraulic Telecontrol Gear, 591*

Beale, Dr. J. F., on Excess Lime Water Purification Process, 692, 711
Bearings, Ball, for Machine Tools, 325*
— for Electric Motors, 191
— Metals. See *Alloys* under *Metallurgy*
— of Oil Engines, Failures of, 308. See LETTER, 299*
— 67,200-kW Steam Turbine, 585*
— Thrust, Michell, History of, 323
Beck, Dr. W., on Corrosion in Gas Mains, 617
Beck, R. & J., Ltd., Microscopes and Accessories, 78
Becker Coke Ovens, Lancashire Steel Corporation, Ltd., Irlam, 539*
Beckton Gas Works, Coke-Oven Plant at, 617
Beet-Sugar Factories, Effluents from, Treatment of, 386
Beetle, Death-Watch, Attack of Timber by, 637
Beharrell, Sir G., on Position of British Industry, 412
Belfast Association of Engineers, Annual Dinner, 334
Belfield, H., Co., Liquid-Level Controller, 138*
Belgium, Gas Manufacture and Distribution in, 618
Bellhis & Morcom, Ltd., 200-b.h.p. Six-Cylinder Oil Engine, 210*; Steam-Driven Gas Compressor, 210*
Belluzzo Steam Turbine, Use in Warships, 322
Belsazar Writing Projection Apparatus, 78
Belt Conveyors, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
B.E.N. Patents, Ltd., Oilmatic Safety Release for Air Compressors, 246*; Two-Hose Car Washer, 328; Valve Coupling for Compressed-Air Pipes, 717*
Bending Machine. See *Machine Tools*
— Tests. See *Tests (Materials)*
Benson Boiler, Langerbrugge Power Station, 11; S.S. "Uckermark," 112; Prevention of Tube Failures in, 682
Benzole, New Processes for Refining, 422
— Petrol and Petrol Mixtures, Ease of Starting with, 300*, 374*. See *Errata*, 430
— Recovery Plant, Coke-Oven Plant, Irlam, 540*
Bergius Process of Hydrogenation, Experiments on, 254
Bergstroem, E. M., on Grampian Hydro-Electric Scheme, 607
Berlin, German National Agricultural Show, 670*
Bermuda Electric Light, Power & Traction Co., Ltd., Fullagar-Diesel Engine, 604*
Bermuda Railway Co., Petrol Locomotives, 676*
Bessemer Medal, Award to Dr. W. H. Hatfield, 524
— Steel Process, Discovery of, 171
Bethnal Green Automatic Telephone Exchange, 316*
Bevel Gears. See *Gears*
Bibber, L. C., on Welding Longitudinal Seams of Ships, 111
Bibliographies, Scientific and Technical, 119
Bicentenary of J. Priestley, 287
Bicycles. See *Cycles* and *Motor Cycles*
Bidston Dock, Birkenhead, Opening of, 498*
Bilham, E. C., on Southend Waterworks, 692
Billeter und Kluna A.-G., Grinding Machine with Swivelling Column, 323*; Surface Grinding Machine, 324*; Ball Bearings for Machine Tools, 325*
Binary Alloys. See *Alloys* under *Metallurgy*
Bins, Storage, for Grain, 136, 141, 147*, 199*, 205*, 568*
Biography, Reflections on, 11
Birkenhead Docks Extensions, 498*
Birmingham, British Industries Fair, 182*, 208*, 223, 240*, 269*. See LETTER, 275. See *Errata*, 304, 305
Birmingham Electric Furnaces, Ltd., Bright-Annealing Furnace, 185*; Forced-Air Circulation Furnace, 248
— James Watt Memorial Institute, 254; Opening of, 548
— Presentation of Murdock Locomotive to, 495
— Sewage Treatment at, 163
— University, Civil Engineering Department, 100-ton Testing Machine, 176*
Bismuth Alloys. See *Alloys* under *Metallurgy*
Bitumen Emulsions for Road Surfaces, 659*
Blackburn Meadows Power Station, New, Sheffield, 378*, 456*, 701*
Blackett, P. M. S., on Cosmic Radiation, 391
Blackwater, River, Southend Water Supply from, 692, 711
Blading, 67,200-kW Steam Turbine, 585*
— 25,000-kW Steam Turbine, New Blackburn Meadows Power Station, 701*
— Turbine, ATV Steel for, 289*
— — Erosion and Corrosion of, 289*
Blairs, Ltd., Plant for Glucose Manufacture, 237*, 397*
Blast Furnaces. See *Furnaces*
Blending Bunkers, Coke-Oven and Recovery Plant, Irlam, 539*
Block Batteries, Ltd., Accumulators, 288
Bloeq van Kuffeler, V. J. P. de, on Zuyder Zee Reclamation, 309
Blohm & Voss Komm-Ges.u.A., Furnace Water-Walls for Marine Boilers, 12*
Bloomsbury, London University New Headquarters, 709
Blow Holes, Weakness Caused by, 488*
Blower, Rotary, with Constrained Blades (B. Donkin & Co., Ltd.), 211*
Blowing Machine, Core (Augusta', Ltd.), 486*
Blunt, W. W., the Late, 330
Board of Education, Courses for Teachers in Technical Schools, 218
— of Trade Reports, Boiler Explosion Inquiries, 233, 621
— — See also *Overseas Trade Department*
Boat, Motor. See *Motor Boat*
Boby, W., Ltd., Sludge Precipitation Plant, 243*. See *Erratum*, 305
Boex, G., on Aluminium Industry in Scotland, 592*, 633*. See 628
Boilers, Babcock & Wilcox, Battersea Power Station, 90*
— Babcock & Wilcox, Dunston Power Station, 155*
— Babcock & Wilcox, Experiments on Circulation in, 483
Boilers, Babcock & Wilcox, Forced-Circulation Type, 112
— Babcock & Wilcox, Tests of, 334
— Benson, Langerbrugge Power Station, 11
— — 3,200-lb. Pressure, S.S. "Uckermark," 112
— — Prevention of Tube Failures in, 682
— Drum, 50-in. Forged (T. Firth & J. Brown, Ltd.), 214
— 650-kW Electrically-Heated (General Electric Co., Ltd.), 272*
— Explosion Inquiries, Board of Trade Reports, 233, 621
— Feed Pump. See *Pump*
— — Water Softener. See *Water Softener*
— Furnaces, Radiation in, 333. See *Erratum* 382. See LETTER, 389
— — Refractories for, Properties and Tests, 4*, 34*
— Gas-Fired (Autocontrol Boilers, Ltd.), 515*
— Heat Transmission in, 333. See *Erratum*, 382. See LETTER, 389
— High-Pressure, Use in Ships, 112
— Lancashire, Dished End for (E. Danks & Co. (Oldbury), Ltd.), 269
— — Pulverised-Fuel Fired, Tests of, 243
— Locomotive, French State Railway, 34*
— — See also *Locomotive*
— Marine, Explosion in S.S. "Mari," 233
— — Furnace Water-Walls for, 12*
— — S.S. "Johore Maru," Evaporation Tests with Pulverised Fuel, 377*
— — Steam Trawler "Frida Sophia," Explosion of, 621
— — Thermal Efficiency with Furnace Water-Walls, 13
— — Types for Cargo Steamers, 393
— Plant, Blast-Furnace Gas Fired, 503
— — Mechanical Breakdowns of, 488*, 496, 554*, 582, 661*. See *Erratum*, 596
— in Russian Power Stations, 476
— Steam-Wagon, Explosion of, 234
— Stirling, New Blackburn Meadows Power Station, 457*
— Waste-Heat, for Cement Kiln, 616*
— Water-Tube, for Cargo Ships, 333. See *Erratum*. See LETTER, 389
— — Tube, Marine, Furnace Water-Walls for, 12*
— — Tube, Naval, Experiments with, 483
— — Tube, Relation between Load and Water Level in, 672*
— Velox, Theory of, 52*, 107, 186*, 259
— Yarrow, Experiments on Circulation in, 483
— — S.S. "Conte di Savoia," 423*
— See also *Engines and Boilers* in PARAGRAPH INDEX
Bolivia, Motor Boat for Lake Titicaca, 15
Bolts, Connecting Rod, Failures of, 583, 661
Bondy, O., on German Symbols for Welding, 479*
Bone, Prof. W. A., on Photographic Analysis of Explosion Flames, 618
Bonney Forge and Tool Works, Welded Pipe Fittings, 70
Books, New, Notes on, 23, 352, 499, 515, 581, 714. See LITERATURE INDEX
— Received, 72, 100, 130, 188, 218, 250, 304, 330, 356, 408, 434, 462, 490, 518, 544, 596, 622, 650, 678
Booth, J. J., on Design of Dominion Museum, 478
Bore Holes. See *Wells*
Borers, Marine, Destruction of Timber by, 187, 217
Boring Machine. See *Machine Tools*
Bornkessel Gas Burner (Chance Brothers & Co., Ltd.), 166
Boron Compounds, Production and Use of, 647
Bottomley, W. T., on Radiation in Boiler Furnaces, 333. See *Erratum*, 382. See LETTER, 389
Boughton Reservoir, Chester Waterworks Co., 576*
Boulevard de Bonne-Nouvelle Station, Paris Metropolitan Railway, 123*
— — Strassbourg Station, Paris Metropolitan Railway, 123*
Boulton & Watt Engines in Cornwall, 440
Boving & Co., Ltd., Sivasamudram Hydro-Electric Scheme, 1*; 24,000-h.p. Double-Runner Hydraulic Turbines, 511*
Boyd, W. R. E., the Late, 418
Boydell Traction Engine, 639
Braby, F., & Co., Ltd., Electric Heating Panels, 271
Bradford, Dr. S. C., on Indexing of Scientific Papers, 119; on Equation of State of Real Fluid, 439
Bradford Technical College, Lectures on Welding, 79
Bradley, Dr. A. J., on Copper-Aluminium Alloys, 327
Brakes for Electric Rolling Stock, 226
Brass, J., on Coal Mining Industry, 164
— Strips, Thin, Hardness Tests of, 364, 367*
Brassey's Naval and Shipping Annual (Review), 601
Brazil, Economic Conditions in, 600
Breakdowns. See *Accidents*
Breguet Steam Turbine, Use in Warships, 322
Breitenstein, A. J., on Coal and Petroleum in United States, 664
Brick-Breaking Machine (Winget, Ltd.), 213*
— Chequer, Multi-Hole, for Hot-Blast Stoves, 502*
— Fire. See *Firebricks*; *Refractory Materials*
Bridges, American, Early, Evolution of, 389
— Decking, Open-Mesh (Irving Iron Works Co.), 636*
— Highway and Railway, across Storström and Masnedsund, Denmark, 497*
— Reconstruction Programme, Memorandum on, 627
— Steel, Design of (Review), 295. See LETTERS, 416, 459
— Sydney Harbour, Souvenir of, 430
— Waterloo, Reconditioning of, 165
Briggs, J., the Late, 107
Brighton Line Electrification, Inauguration, 19
Brinell Tests. See *Hardness* under *Tests (Materials)*
Bristol Channel Tides, Effect of Severn Barrage Scheme, 507, 594, 599
"Bristol," H.M.S., 22,000-s.h.p. Brown-Curtis Turbines, 322
— University, Experiments on Vacuum Production by Air Ejectors, 230*, 262*. See 255*
British Aluminium Co., Ltd., Production of Aluminium by, 592*, 628, 633*

British Association (York Meeting):

Section K (Forestry)*:
Research in Woodworking, by P. Harris, 27*

(Leicester Meeting):

Section G (Engineering):
Programme, 708
British Association for Commercial Education, Aims of, 523
— Broadcasting Corporation, West Regional Broadcasting Station, 542*
— Cast-Iron Research Association, Desulphurisation and Refinement of Cast Iron, by N. L. Evans, 59
— Chemical Plant Manufacturers' Association, Annual Dinner, 135
— Colonies, Taxation of Advertisement Matter by, 627
— Electrical and Allied Industries Research Association, Annual Report, 352; Researches on Saturated Steam, 707; Annual Luncheon, 223
— — and Allied Manufacturers' Association, Annual Report, 390; Annual Dinner, 575; Work of, 601
— — Development Association, Annual Luncheon, 334; Reorganisation of, 627
— Engineers' Association, Views on Duty on Heavy Oils, 575
— Foundrymen, Institute of. See *Foundrymen*
— Guiana, Georgetown, Main Drainage of, 417
— Industries Fair, Birmingham, 182*, 208*, 223, 240*, 269*. See LETTER, 275. See *Errata*, 304, 305
— — Federation of, Presidential Address by Sir G. Beharrell, 412
— Insulated Cables, Ltd., Cable Manufacturing Film, 100
— Isles, Rainfall of, 1820-1929, 637
— — Wind Direction in, since 1341, 652
— Navy. See *H.M.* under *Warships*
— Railways. See *Railways*
— Rema Manufacturing Co., Ltd., Automatic Load-Adjusting Power Transmission Clutch, 88*
— Reverberatory Furnaces, Ltd., 600-lb. Oil-Fired Melting Furnace, 185*
— Rubber Manufacturers' Research Association, Position of, 259
— Science Guild, Research and Development Lecture on Metals in Service of Human Life and Industry, by Sir H. Carpenter, 575; Annual Meeting, 678
— Standards Institution. See *Standards Institution*
— Steelwork Association, Memorandum on Bridge Reconstruction, 627
— Thomson-Houston Co., Ltd., 12,000-volt Motor Generator, 25*; Turbo-Generators for Battersea Power Station, 91*, 585*, 667*; Electrical Plant Construction in 1932, 203; Control System for Electric Ship Propulsion, 236; Electro-Hydraulic Thrustors, 249*
— Trade. See *Trade*
— Trane Co., Ltd., Heating Appliances, 271
Brittany, Lorient, 650-ton Marine Turntable Slipway, 559*, 629*
Broadbent, T., & Sons, Ltd., Magnetic Clutch for Power Transmission, 660*
Brooke Tool Manufacturing Co., Ltd., Drill Chuck, 212*
Brookes (Oldbury), Ltd., Guillotine Shearing Machine, 240*
Brookhirst Switchgear, Ltd., Developments in Circuit Breaker Design, 48. See LETTERS, 216, 259, 275, 364, 578
Brooks, Dr. C. E. P., on Wind Direction in British Isles, 652
Brotherhood, P., Ltd., 260-b.h.p. Six-Cylinder Diesel Engine, 594*
Broughton, H. H., on Handling and Sorting of Grain, 141*, 199*. See 136, 568*
Broughton, J., Power Press Guards, 270*
Brown Boveri Velox Boiler, Theory of, 52*, 107, 186*, 259
Brown, D., & Sons (Huddersfield), Ltd., Radicon Worm Reduction Gear, 594*
Brown-Firth Research Laboratories, Exhibits at Royal Society Conversazione, 566
Brown Instrument Co., Mechanical Flow Meter, 530*
Brown, J., & Co., Ltd., Development of Curtis Steam Turbine, 322
Brunt, D., on Adiabatic Lapse-Rate for Air, 652
Brunton, J. D., Fatigue-Testing Machine for Wire, 567*
Brushing and Burnishing Machine, Tube (F. Gilman (B.S.T.), Ltd.), 210*
Bryan, B. W., on Stour Scheme of South Essex Waterworks, 711
Bryce, Ltd., Fuel-Injection Equipment for Oil Engines, 128*
Buenos Aires Great Southern Railway, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*; 1,700-h.p. Oil-Electric Mobile Power Houses, 328*; 1,700-h.p. Diesel-Electric Locomotive, 328
Builders' Prices, Analysis of (Review), 404
Building, Cold-Storage, Insulating Materials for, 537
— Electrically-Welded (Agile (London), Ltd.), 444
— and Engineering Contracts, Arbitration in, 547
— Heating by Gas, 618
— Industries National Council, Formation of, 165
— Materials, Definitions for Fire Resistance of, 651
— Societies, National Association of, Formation, 165
Building Steel (Review), 123
— Timber, Investigation of Decay of, 637
Buma Engineering Co., Motor-Cylinder Boring and Honing Machines, 229*
Bunkers, Blending, Coke-Oven and Recovery Plant, Irlam, 539
Burckhardt, J. E., on Performance of S.S. "Mariposa" and "Monterey," 113
Burdons, Ltd., Oil-Fired Annealing Furnace, 242*
Bureau of Mines. See *United States*.
Burmah Oil Co. Ltd., Diesel-Driven Slush Pump, 594*
Burner, Gas, Bornkessel (Chance Brothers & Co., Ltd.), 166
— Oil-Fuel. See *Oil Fuel*
Burntisland Works, British Aluminium Co., Ltd., Alumina Production at, 592
Burrell, C., & Sons, Boydell Traction Engine, 639; Development of Traction Engines by, 641*. See LETTER, 687
Bush, H. D., on Rail Transport with Diesel Engines, 265
Busk Studentship in Aeronautics, 622
Butler Machine Tool Co., Ltd., 18-in. Stroke Shaping Machine, 154*; Tool-Room Slotting Machine, 303*
By-Product Coking Industry, International Handbook of (Review), 669

C.

CABLES. See *Wire Ropes* and *Electric*
Cadman, Sir J., Award of Melchett Medal to, 679
Cages, Mine, Dangers of Safety Catches for, 426*
Caisson, Sliding, Southampton Graving Dock, 697*
Calciners, Rotary, for Alumina Production, 592, 628
Calculating Machine, Electrical, The Mallock, 567*
Calcutta Electric Supply Corporation, River Hooghly Tunnel, 41
California, Nitrate Deposits in, 21
Callendar, G. S., on Properties of Saturated Steam, 707
Callendar, Dr. L. H., on Graphitic Silicon and Electrical Conductivity of Aluminium, 327
Callender's Cable and Construction Co., Ltd., Transmission Towers and Earth Resistance, 145*. See *Addendum*, 250
Calomic Resistance Alloy, 97
Calorifiers, Hot-Water Service, S.S. "Conte di Savoia," 607*
Calorimeter, Bomb, Griffin-Sutton, 96*
Cambridge Instrument Co., Ltd., Pot Galvanometer, 59; Moisture Meter, 49*; Soil-Conductivity Bridge, 50*; Hydrogen-Ion Meter, 50*; Eupatheoscope, 50; Exhibits at British Industries Fair, 245*; Mallock Calculating Machine, 567*
— International Congress for Applied Mechanics, 1934, 709
— Royal Society Mond Laboratory, Opening of, 165
— University Engineering Department, Extensions, 117*; Busk Studentship in Aeronautics, 622
Camera, Radium, for Engineering Practice, 340*
Cammen, L., on Mechanism of Lubrication, 217, 275
Campbell, J., the Late, 24
Campbell, Sir M., Motor-Car Speed Record by, 282
Canada, Alberta, Scientific Research in, Report, 146
— Handling and Storing of Grain in, 136, 141*, 199*, 568*
— Hydro-Electric Progress in, Report, 526
— Montreal, 12,000-lb. Grain-Weighing Machine, 668*. See 136, 141*, 199*
Canadian Electrical Code, 223. See *Errata*, 249
— Institute of Mining and Metallurgy, Annual Banquet, 413
— National Railways, Diesel-Engined Locomotives and Rail Coaches on, 265, 454
— Nickel Industry, Jubilee of, 413
Canning, W., & Co., Ltd., Rotary Chromium-Plating Apparatus, 270*; Bench Plating Barrel, 270*; Polishing Machine with Dust Extractor, 270*
Cantieri Riuniti dell' Adriatico, 150-ton Floating Crane, 177*; S.S. "Conte di Savoia," 245*, 423*, 507*, 606*, 650. See 54, 107, 470, 578. See *Erratum*, 596
Cape Town, New Broadcasting Station, 46
Capital and Labour. See *Labour*
Capstan Lathe. See *Lathe* under *Machine Tools*
Carbon Electrode Production at Kinlochleven Works, 592, 633*
— Tetrachloride, Influence on Magnesium and Copper, 363, 675
— Water Purification by, 711
Carburettor, Experimental, for Motor-Fuel Starting Tests, 300*, 374*. See *Errata*, 430
Cargo Fleet Iron Co., Ltd., Exhibits at British Industries Fair, 271
— Steamers. See *Steamers*
Carless Capel & Leonard, Petrol from Coal for Aircraft, 361
Carnegie Steel Co., 1,000-ton Blast Furnace, 501*
Carpenter, Sir H. C. H., on Changes on Heating Hypo-Eutectoid Steels, 541; on Metals in Human Life and Industry, 575
Carriage, Railway, 250-h.p. Diesel-Electric (Sir W. G. Armstrong, Whitworth & Co. (Engineers), Ltd.), 255, 330. See 281. See LETTERS, 299, 338
— — Diesel-Engined, Operating Results with, 265
— — Diesel-Engined, Reliability and Economy of, 454
— — Electric Control Gear for, Copenhagen Railways, 476*
— — for Electric Trains, 226
— — First, 694

Carriage, Railway, First Diesel-Electric, Performance, 454
— — Motor, with Pneumatic Tyres, 653
— — Paris Metropolitan Railway, 428*
"Royal Scot" Express Train, London Midland and Scottish Railway, 558
— — Use of Aluminium in, 628
Cars, Motor. See *Motor Cars*
Carter Disc Separators, 80,000-ton Granary, Bahia Blanca, 205*
Cast-Iron, Application to Structures, 447
— — Desulphurisation by Soda Ash, 59
— — Fatigue Properties of, 238. See LETTER, 299, 459
— — Hardened, Influence of Phosphorus on, 590
— — Nickel-Chromium, Properties and Applications of, 665
— — Paving (Stanton Ironworks Co., Ltd.), 174
— — Research Association, British, Desulphurisation and Refinement of Cast-Iron, by N. L. Evans, 59
— — Syphon, River Dee, Chester Waterworks, 577*
Castings, Radiographic Examination of, 335, 340*
— Steel, Investigation of Defects in, 557, 589, 638*
— — Large (Hadfields, Ltd.), 638*. See 557, 589
— — Repair by Electric Welding, 420
Catalogues, 146, 236, 266, 292, 318, 370, 448, 477, 558, 610, 638, 665, 692, 717. See PARAGRAPH INDEX
"Catch me who can," Trevithick's Locomotive, 693*
Catches, Safety, for Mine Cages and Skips, Dangers of, 426*
Caterpillar Tractor. See *Tractor*
Catterson-Smith, R. M., Electric Resistance Furnace, 97
Cauvery River, India, Sivasamudram Hydro-Electric Scheme, 1*; Metur Dam, 55*; Industrial Developments at Metur, 658
C.B. Magnetic Clutch (T. Broadbent & Sons, Ltd.), 660*
Celluloid, Safety in Manufacture and Use, Report, 654
Cement in Concrete, Effect on Costs, 19
— Kiln, Wet-Process, Waste-Heat Boiler for, 616*
— See also *Concrete* and PARAGRAPH INDEX
Cementation. See *Heat Treatment* under *Metallurgy*
Censier-Daubenton Station, Paris Metropolitan Railway, 63*
Centenaries, Engineering, 19. See LETTER, 81
Centenary of Sir R. Tangye, 81
— of Trevithick, 106, 408, 439*, 459, 463, 467, 693*
Central Electricity Board, Tests of Earth Resistance of Power Transmission Towers, 145*. See *Addendum*, 250; Report, 411
— Station. See *Power Station*
Centrifugal Pumps. See *Pumps*
Ceramic Society (Refractory Materials and Building Materials Sections), Constitution of Coal, by Dr. F. V. Tideswell, 610; Winning and Transport of Basic Raw Materials used in Heavy Clay and Refractories Industries, by F. West, 610; Winning and Transport of Clay, by E. G. Veyers, 610; True Cost of Raw Materials to Firebrick Manufacturer, by W. B. Mitchell, 610; Permeability of Refractory Materials to Gases, by F. H. Clews and A. T. Green, 610
Ceres Pumping Set (Gwynnes Pumps, Ltd.), 699*
Cesari, E., on Electricity Supply in Italy, 174
Chadwick, R., on Cold Rolling of Zinc, 326
Chain Track Tractor. See *Tractor*
Chamber of Shipping, Annual Report, 222
Chamberlain & Hookham, Ltd., Testing Set for Polyphase Meters, 59
Chance Brothers & Co., Ltd., Optical Glass, 166; Bornkessel Gas Burner, 166; Portable Floodlight for Aerodromes, 661*
Charging Car, Coke-Oven and Recovery Plant, Irlam, 539*
— Plant for American Blast Furnaces, 503*
Chart, Temperature Measurement and Control, 67*. See *Addendum*, 275
Chelmer, River, Southend Water Supply from, 692, 711
Chemical Embrittlement, Failures due to, 583, 663*. See *Erratum*, 596
— Engineering, Progress of, 165
— Engineers, Institution of, British Practice in Sewage Disposal, by H. C. Whitehead and F. R. O'Shaughnessy, 163; Sewage Treatment in America, by L. R. Howson, 163; German Practice in Sewage Disposal, by Dr. K. Imhoff, 163; Annual Meeting and Dinner, 255
— Pipe Lines, Identification Plates, Specification, 101
Chemistry of Corrosion. See *Corrosion*
— Glucose Manufacture, 237*, 397*
— Transmutation of the Elements, Researches on, 348
— See also PARAGRAPH INDEX
Chequer Tiles, Multi-Hole, for Hot-Blast Stoves, 502*
Cherry, H. C. E., on Earthquakes and Structural Design, 478
Chest, Sterilising Electrically-Operated (General Electric Co., Ltd.), 700*
Chester Corporation *versus* Lakeman, Compensation for Change of Electric System, 283
Chester Waterworks Co., Boughton Reservoir, 576*
Chesterfield Corporation, Gas-Driven Motor Omnibus, 211
Chicago Bridge and Iron Works, Electrically-Welded Spheres, 688*
— World's Fair, "Royal Scot" Express Train at, 558
Children and Dangerous Machinery, 626
Chile, Economic Conditions in, Report, 466
— Nitrate Deposits in, 21
Chimneys, Armco Iron, New Blackburn Meadows Power Station, 457*
— Battersea Power Station, 89*
Chiswick Works, London General Omnibus Co., Oxy-Acetylene Welding Installation, 353*
Chlorides, Volatile, Influence on Magnesium and Copper, 363, 675
Christiani & Nielsen, S.A., 80,000-ton Granary, Bahia Blanca, 148*
Chuck. See *Machine Tools*
Churcher, B. G., on Acoustics Laboratory of Metropolitan-Vickers Electrical Co., Ltd., 563*
Cinematograph. See *Kinematograph*
Circular Saws. See *Saws* under *Machine Tools*
Circulating Pumps. See *Pumps*
— Water Chambers, Battersea Power Station, 89*
— — Tunnels, Ford Motor Works, Dagenham, 169
Circulator for Hot-Water Heating Systems (Holden & Brooke, Ltd.), 448*
Civil Engineering Works, Use of Electricity in, 632
— Engineers, French Society of, Commemoration of 50th Anniversary of Introduction of Basic Steel Process into France, 171; Dephosphorisation and Deoxidation of Steel, 488, 674

Civil Engineers, Institution of:

The River Hooghly Tunnel, by C. M. Norrie, 41
Laws of Syphon Flow, by P. Davies, 115
Observations on Surge-Tank Installations and Scale Models thereof, by Prof. A. H. Gibson and W. Cowen, 116
Power-House Foundations and Circulating-Water Tunnels at Ford Motor Company's Works, Dagenham, by R. V. Allin and M. Nachshen, 169
Electric Trains for Services with Frequent Stops, by C. B. Unwin, 226
Primary Considerations Relating to Steam, Electric and Diesel-Electric Traction, by H. W. H. Richards, 226
Design of Electric Rolling Stock for Intense Service, by W. S. Graff-Baker, 226
Annual Dinner, 282
Construction of Aerodromes, by H. A. Lewis-Dale, 329
Main Drainage of Georgetown, British Guiana, by G. H. Humphreys and I. M. E. Aitken, 417
Jamshedpur Sewage Pumping Stations, by F. C. Temple, 417
Influence of Earthquakes on Structural Design, by H. C. E. Cherry, 478
Effect of Earthquakes on Engineering Structures, by F. W. Furkert, 478
Design of Earthquake-Resisting Structures: The Dominion Museum, Wellington, New Zealand, by J. J. Booth, 478
Report of Committee on Engineering Quantities, 547
Conversazione and Exhibition, 685*
Report of Committee on Deterioration of Structures in Sea Water, 708

Manchester and District Association:

Uses of Electricity on Site of Engineering Works, by G. T. Allcock, 632

Yorkshire Association:

Main Road Public Lighting, by C. C. Kirby, 11

Civil Servants, Professional, Institution of, Policy of, 627
Clarke, Chapman & Co., Ltd., Pulverised-Fuel Installations, 8.8. "Johore Maru" and "Nagoya Maru," 377*
Clarkson, T., the Late, 417
Claxton, G., on Ease of Starting with Benzole and Petrol, 300*, 374*. See *Errata*, 430
Clays, Fire. See *Firebricks*; *Refractory Materials*
— Industry, Winning and Transport of Materials in, 610
Clayton & Shuttleworth, Ltd., Development of Traction Engines by, 639*. See LETTER, 687
Cleaner, Vacuum, Portable (Spencer Turbine Co.), 39*
Cleaning Plant, Grain, in Canadian Granaries, 144; 80,000-ton Granary, Bahia Blanca, 205*
Cleveland Iron Prices. See *Metal-Price Diagrams*
— and the Northern Counties, Notes from, 14, 45, 72, 100, 131, 161, 188, 219, 250, 279, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705. See PARAGRAPH INDEX
Clews, F. H., on Permeability of Refractory Materials to Gases, 610
Climate. See *Meteorological*
Clinkering of Refractories in Boiler Furnaces, 7
Clipping Machine, Motor-Driven (Hauptner), 671*
Clocks, Electric, Mains-Operated, Specification, 399
Clutch, Friction, Toggle-Operated Disc-Type (Taylor Brothers), 292*
— Magnetic, for Power Transmission (T. Broadbent & Sons, Ltd.), 660*
— Power Transmission, Automatic Load-Adjusting (British Rema Manufacturing Co., Ltd.), 88*
Coaches, Railway. See *Carriages*
Coal Discharging Plant, Gothenburg Harbour, 687*
— Gas. See *Gas*
— Handling Plant, Battersea Power Station, 89*
— — Plant, New Blackburn Meadows Power Station, 456*
— Low Coking Power, Carbonisation of, Report, 717
— — Temperature Carbonisation, Experiments on, 254
— Microscopic Examination of, 610
— Mines Act, Effect on Shipping Industry, 223
— — See also *Colliery*
— Mining Industry, Problems of, 164
— Oil from, for H.M. Navy, 193. See 164, 361
— and Oil in United States, Competition between, 664. See 642
Coal, Petrol Production from, 164, 361. See 193
— Preparation and Ore Dressing Compared, 665
— Pulverised. See *Pulverised Coal*
— Research in Alberta, 146
— in United States, Competitive Position of (Review), 642
— Utilisation Council, Pamphlet on Coal and Oil, 601
— *versus* Oil Fuel, Pamphlet on, 601
— Washing Plants, introduction of, 665
— See also PARAGRAPH INDEX
Coastal Trade Development Council, Views of, 467
Coasting Vessels, Propeller Experiments with Models, 468
Coastwise Shipping, 600. See LETTER, 687
Cochrane Corporation, Pilot-Controlled Regulating Valve, 139*; Vapour Turbine, 140*
Cofferdam, Steel Sheet-Pile, Ford Motor Works, Dagenham, 169
Coke, Blast-Furnace, Effect of Removal of Breeze, 525, 531*
— for Carbon Electrode Production, 633
— Handling Plant for American Blast-Furnaces, 503*
— Oven Gas Washing, Effluent from, 286
— — Plant at Beckton Gas Works, 617
— — Plant, Pont Brûlé, Vilvorde, 618
— Research Committee, Midland, Investigation of the Effect of Breeze on Coke Consumption in Blast Furnaces, 525, 531*; Investigation of External Heat Loss of Blast Furnace, 526
Coker, Prof. E. G., on Stress Distributions in Welded Plates, 442
Coking Industry, By-Product, International Handbook of (Review), 669
— Low-Temperature, of Coal. See *Coal*
Colas Products, Ltd., Bitumen Emulsions for Road Surfaces, 659*
Cold Storage. See *Refrigeration*
— Saw. See *Machine Tools*
College. See *Education*
Collet and Engelhard A.-G., Leaf-Spring Bending and Tempering Machine, 481*
Collieries, British, Mining Practice in, 164
— Cages, Dangers of Safety Catches for, 426*
— Flame-Proof Plugs and Sockets, 680
— Ignition of Fire Damp by Explosives, Report, 110
— Lighting at Coal Face, 619
— Machinery, Modern Practice in (Review), 403
— Use of Liquid-Oxygen Explosives in, 18
— Winding. See *Winding*
— Wonthaggi, Victoria, Australia, 102
— Yieldable Metal Props for, 665
— See also *Mines* and *Coal*
Collins, A. E., the Late, 108
Collisions. See *Accidents*
Colouring of Foundry Patterns, Specification, 140
Combined Stress. See under *Tests* (*Materials*)
Combustions, Ltd., Rotamiser Oil Burner, 186
Commentry - Fourchambault Co., ATV Steels, 289*
Commerce, International Chamber of, Vienna Meeting, Report on Mercantile Shipping Crisis, 600. See LETTER, 687
— See *Trade*. See also *Industries and Commerce* in PARAGRAPH INDEX
Commercial Motor-Cars. See *Motor*
Companies. See PARAGRAPH INDEX
Compasses, Magnetic, at Ashmolean Museum, Oxford, 535
Compensation, Workmen's. See *Labour*
Compound Locomotives. See *Locomotives*
— Stress. See *Tests* (*Materials*)
Compressed-Air Plant for Switchgear, New Blackburn Meadows Power Station, 378*
— — Tools. See *Machine Tools*
Compressor, Air. See *Air Compressor*
— Gas. See *Gas Compressor*
Concrete, Aerated, as Insulating Material, 536
— Costs, Reduction of, 19
— Cured, Tests of, 659
— Dam, Ryburn Valley Water Scheme, 602
— Engineering (Review), 614
— Mixer, Revolving-Pan (Liner Concrete Machinery Co.), 445*
— Pervibrateurs, Paris Metropolitan Railway, 371*
— Pouring Skip (R. Hudson, Ltd.), 212*
— Reinforced. See *Ferro-Concrete*
— Retaining Walls, Minimum-Section Trapezoidal, 644*
— Road, Control of Cracks in, 402
— — Treatment with Bitumen Emulsions, 659*
— Samples, Microphotographs of, 686
— Walls, Southampton Graving Dock, 697*
— See also *Ferro-Concrete* and PARAGRAPH INDEX
Condenser, Air-Cooled, for Locomotive (Henschel und Sohn A.-G.), 517*
— Atmospheric, Grimsby Fish-Dock Ice-Making Plant, 648*
Condensing Plant, Battersea Power Station, 91
— — Dunston Power Station, 156
— — New Blackburn Meadows Power Station, 702*
— — S.S. "Conte di Savoia," 423*
Conductivity of Insulating Materials, 536
— See also *Electric*
Conference on Empire Timber, 105
— International High-Tension, Paris, 99
— Technical, International, on Motor Tyre and Rim Standardisation, 709
— World Economic, Opening of, 654
Congleton, Lord, the Late, 11
Congress, National Safety, London, 506, 574
— International, for Applied Mechanics, Cambridge, 1934, 709
— World Petroleum, London, 197, 391, 540
Constructional Engineering Co., Ltd., Oil-Fired Sand Drier, 551*
— — Industry, Position and Prospects, 443
Consulting Engineers, Association of, Annual Report, 683
Containers for Liquid Oxygen, 18
"Conte di Savoia," S.S., 345*, 423*, 507*, 606*, 650; Gyroscopic Stabilisers, 345*, 507*. See 54, 107, 470, 578. See *Erratum*, 596
Conti, Prince G., on Steam Springs of Tuscany, 522
Contracts, 14, 44, 72, 100, 160, 188, 218, 250, 278, 304, 382, 408, 434, 462, 490, 518, 544, 570, 622, 650, 678, 704.
Control Cabinets, General Electric Co., Ltd., 273*
— Gear for Electric Rail Coaches, Copenhagen Railways, 476*
— — Electro-Pneumatic, for Petrol Locomotives, 676*
— — for Hydraulic Turbines, Tummel Bridge Hydro-Electric Plant, 512*
— Room, Coke-Oven and Recovery Plant, Irlam, 539*
— — New Blackburn Meadows Power Station, 379*
— Systems for Electric Ship Propulsion, 236
Controllers, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 350*
— Electric Motor. See *Motors, Electric*
— Flow, Magnetic-Clutch (C. F. Tagliabue Manufacturing Co.), 582*
— Humidity (Negretti & Zambra), 166*
— and Recorders, Air-Operated (G. Kent, Ltd.), 209*
— Liquid-Level (H. Belfield Co.), 138*
— Thermionic-Valve, for Resistance Welding (Cutler-Hammer, Inc.), 195*
Converter, Bessemer, Effect of Invention of, 171
— Glucose, 237*
— Phase, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*
Conveyors, Belt, for Alumina-Production Plant, 503
— — Battersea Power Station, 90*
— — 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
— — New Blackburn Meadows Power Station, 456*
— System, Coke-Oven and Recovery Plant, Irlam, 540*
Cook, Dr. M., on Hardness Testing of Thin Copper Strips, 367*. See 364
Cooke *versus* Midland Great Western Co. of Ireland, 626
Coolers, Primary, Coke-Oven and Recovery Plant, Irlam, 539
— Water and Oil, for Diesel Locomotive (Spiral Tube and Components Co.), 287*
Cooling of Piston Rods for Oil Engines, 484
— System for 80,000-kVA Alternator, 668
— — for Electric Motors, 191
— — Phase Converter, 2,500-h.p. Electric Locomotive, Hungarian Railways, 298*
— Towers, New Blackburn Meadows Power Station, 702*
Copenhagen Suburban Railways, Electric Traction Equipment for, 476*
Copper Alloys. See *Brass*; *Bronze*; *Gunmetal*; and *Alloys* under *Metallurgy*
— Aluminium Alloys, Röntgen-Ray Investigation of, 327
— Imports of, 92
— Influence of Volatile Chlorides on 363, 675
— Ingots, Distribution of Porosity in, 362
— Molten, and Steam, Reaction between, 363
— Nickel, Effects of Hydrogen and Oxygen on, 363
— Prices. See *Metal-Price Diagrams*
— Strips, Thin, Hardness Tests of, 364, 367*
— Tubing, Arsenical, Fabrication and Properties of, 665
— Wire, Enamelled, Specification, 650
— See also *Metallurgy*
Core-Blowing Machine (Augusts', Ltd.), 486*
— Box Vice (Newman, Hender & Co., Ltd.), 487*
— Machine, Rotary (Fordath Engineering Co., Ltd.), 487*
Corners, Sharp, Machinery Failures from, 451*
Cornwall, Boulton & Watt Engines in, 440
— Newcomen Society Summer Meeting, 571, 713
Corrosion through Atmospheric Pollution, 493
— Electrolytic, in Gas Mains, 617
— Fatigue Tests on Aircraft Materials, 542
— Intergranular, of Stainless Steels, 615, 689*
— of Internal-Combustion Engine Valves, 56*
— of Iron, Effect of Sulphur and Phosphorus on, 590
— Sea-Water, of Iron and Steel, Report, 708
— of Steam Turbine Blading, 289
Cosmic Radiation, Investigation of, 391
Counting Apparatus, Time Interval, Automatic, 602
— Machines, Dual-Ratio (W. & T. Avery, Ltd.), 244*
— Mechanisms, Variable-Speed Gear for, 686
Coupling, Axien Flexible (Turbine Gears, Ltd.), 247*
— Flexible, 25,000-kW Three-Cylinder Turbo-Generator, 701*
— Valve, for Compressed-Air Pipes (B.E.N. Patents, Ltd.), 717*
— See also *Clutch*
Couves, H. A., Dunston Power Station, 155*
Cowen, W., on Surge-Tank Investigations, 116
Cowper-Coles, S., Sherrite Steel Sheets, 584
Cox & Danks, Ltd., Salvage of German Battleship "Prinz Regent Luitpold," 545
Cracking of Cast-Iron Rolls, 238. See LETTER, 299, 459
Cracks, Investigation of, 489*, 496, 554*, 583 661*
Craig, G. L., on Arsenical-Copper Tubing, 665
Crane, Dredging, Steam (Ransomes & Rapier, Ltd.), 501*
— 150-ton Floating, for Trieste, 177*
— 300-ton Overhead Travelling, Diablo Hydro-Electric Power Station, Washington, 416*
— Transporter, New Blackburn Meadows Power Station, 456*
— Travelling, Overhead Electric, Specification of, 7
Crankshafts, Investigation of Failures of, 488 496, 554*, 583
Craven Brothers (Manchester), Ltd., 26-in Centre Square Ingot Turning Lathe, 106*
Creep in Steel at High Temperature, 447.
Creosote, Wood Preservation by, 433
Creswell, F. L., 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*

Crewe Technical Institute Engineering Society, Rail Transport with Diesel Engines, by H. D. Bush, 265
Critical Points, Metals. See *Metallurgy*
Crompton Parkinson, Ltd., Thermal Maximum-Demand Indicator, 94*; Ring-Main Control Unit, 274*
Crossley, G., Ltd., Wire-Drawing Machines, 608*
"Crowstone," Motor Tug, General Wharfage & Supply Co., 158*
Crude Oil Engine. See *Engines, Oil*
Cruisers. See *Warships*
Crushing Plant for Metur Dam (Hadfields, Ltd.), 55
Crystalline Structure of Metals. See *Metallography; Micro-Photographs*
Crystallisation, Columnar, in Normalised Steel Sheets, 542
— Process for Glucose Manufacture, 390
Culverts, Circulating Water, Southampton Power Station, 613*
— Storm-Water, Southampton Dock Extension, 613*
Curtis Steam Turbine, Use in Warships, 322
Cussons, G., Ltd., Nevson Tangraph Rule, 448
Cuthbertson, J. W., on Aluminium Alloys at Elevated Temperatures, 342*. See 327
Cutler-Hammer Inc., Controller for Resistance Welding, 195*
Cutter, Root, Motor Driven, 671*
Cycle Industry, Position and Prospects, 150
— Motor. See *Motor Cycle*
Cylinders, Compressed-Air, for Circuit-Breaker Operation, 379*
— Hydraulic, for Cotton Press (Hadfields, Ltd.), 638* See 557, 589
— of Oil Engines, Wear of, 308
Cylindrical Grinding Machine. See *Grinding Machine* under *Machine Tools*
— Heterogeneity, Effect on Stress Distribution, 695*

D.

DAGENHAM, Ford Motor Works, Foundations and Tunnels at, 169
— Thames Transmission Towers, Earth Resistance of, 145*. See *Addendum*, 250
Dairies, Effluents from, Investigation, 386
Dalrymple-Hay, Sir H. H., River Hooghly Tunnel, 41
Dam, Concrete, Ryburn Valley Water Scheme, 692
— Loch Ericht Hydro-Electric Scheme, 607
— Metur, Madras, 55*
— Severn Barrage Scheme, 307, 394*, 599
Daniels, T. H. & J., Ltd., Paper-Making Cylinder Mould, 240*; Injection Moulding Machine, 240*; Tablet Pre-Forming Machine, 240*
Danish State Railways, Diesel-Engined Locomotives and Rail Coaches on, 454; Electric Traction Equipment for, 476*
— See also *Denmark*
Danks, E., & Co. (Oldbury), Ltd., Dished End for Lancashire Boiler, 269
Dartford Church, Trevithick Memorial Service, 467. See 106, 439*, 459, 463, 693*
— Industries, Association of, Centenary of R. Trevithick, 106. See 439*, 459, 463, 467, 693*
Davenport Engineering Co., Ltd., Natural-Draught Cooling Towers, New Blackburn Meadows Power Station, 702*
Davies, Dr. S. J., on Flow in Oil-Engine Injection Systems, 715*
Davies, P., on Laws of Syphon Flow, 115
Davis, J. A., on Rules for Areas, Moments and Moments of Inertia, 508*
Davits, Libani and Welin, S.S. "Conte di Savoia," 606*
Davy, C. H., on the Benson Boiler, Langerbrugge, 11
Daytona Beach, Motor-Car Speed Record at, 282
De Laval Steam Turbine Co., Propeller-Type Pump, 99*
De Laval Steam Turbine, First in United States, 713*
Decimal Classification for Indexing, 120
Decking, Bridge, Open-Mesh (Irving Iron Works Co.), 636*
Decolorisation Plant for Glucose Manufacture, 238
Decomposers for Alumina Production, 592
"Decoy," H.M. Destroyer, 100
Dee, River, Cast-Iron Syphon, Chester Waterworks, 577*
Delray Power Station, ATV Steel Turbine Blading at, 290*
Denholm-Young, J., the Late, 137
Denmark, Bridges across Storström and Masnedsund, 497*
— Copenhagen Railways, Electric Traction Equipment for, 476*
— See also *Danish*
Derby Show, Royal Agricultural Society, 698*
Designs and Patents Act, 1932, 365
Destroyers. See *Warships*
Desulphurisation of Cast Iron by Soda Ash, 59
Detectors, Road, for Electro-matic Traffic Control, 388. See 596
Detroit Edison Co., Delray Power Station, ATV Steel Turbine Blading for, 290*
Deutsche-Niles-Werke A.-G., Boring Machine Spindle and Faceplate, 402*
"Deutschland," S.S., Furnace Water-Walls in Boilers, 12*
Dewrance & Co., Bi-Colour Water Gauge, 602*
Dexter Valve-Seating Machine (Leavitt Machine Co.), 138*
Diablo Hydro-Electric Power Station, Washington, 300-ton Overhead Crane, 416*
Diagrams, Indicator. See *Indicator*
— Metal-Price. See *Metal-Price Diagrams*
Diaphragms, Built-up, 67,200-kW Turbo-Alternators, 585*
— 25,000-kW Steam Turbine, New Blackburn Meadows Power Station, 701*
Diathermy Apparatus (Marconi Wireless Telegraph Co., Ltd.), 167
Dickin, J. H., on Electrical Conductivity of Aluminium Wire, 473*. See 327
Dickinson, H. W., on Shetland Water Mills, 292
Dies for Steel Wire Drawing, 608*
Diesel Elektriska Vagn Aktiebolaget (Deva), First Diesel-Electric Rail Coach, 454
— Engine Users' Association, Views on Duty on Heavy Oils, 575
— —. See *Engines, Oil, Diesel; Marine Propulsion*
Differential Gear. See *Gear; Motor-Car Details*
Diffusers for Air Ejector Experiments, 230*, 255*, 262*
Digesters, Steel, for Alumina Production, 593*
Digging Machine. See *Excavating Machine*
Dight, Engr.-Capt. S. R., on Naval Water-Tube Boilers, 483
Dilatometer, Universal (E. Leitz), 482*
Directories. See LITERATURE INDEX
Discharging Plant, Coal, Gothenburg Harbour, 687*
Discs, Turbine, Failures of, 662
— — Vibration Frequency Tests, 585*
Disintegrator, Agricultural, Motor-Driven (A. Hummel Söhne), 671*
Distillation System, Feed-Water, Valenciennes Power Station, 116*
Distributing Apparatus for Alternating-Stress Testing Machine, 433*
Dixon, F. J., Boughton Reservoir, Chester Waterworks, 576*
Dock, Southampton, Extensions, 611*, 696*
— Graving, Southampton Dock Extensions, 611*, 696*
— Liverpool & Birkenhead, Extensions, 496*
Dominion Museum, Wellington, New Zealand, Design of, 478
— Water Power and Hydrometric Bureau, Canada, Report, 526
Donkin, B., & Co., Ltd., Rotary Blower with Constrained Blades, 211*; High-Pressure Gas Compressor, 211*
Donovan *versus* Union Cartage Co., Ltd., 626
Dorey, Dr. S. F., on Water-Cooled Piston Rods in Oil Engines, 484
Dorman, Long & Co., Ltd., Dunston Power Station, 155*; Chromador High-Tensile Structural Steel, 275; Souvenir of Sydney Harbour Bridge, 430; Storström and Masnedsund Bridges, Denmark, 497*
Drainage, Land (Review), 64
— Main, of Georgetown, British Guiana, 417
Drawing Office Material, Manufacturers' and Dealers' Association, Annual Dinner, 136
Drayton Regulator and Instrument Co., Ltd., Heat-Motor Valve, 50*; Electric Motor Unit for Valve Operation, 51*; Fluid-Flow Ratio Regulator, 261*
Dredger-Excavator, Bucket, 1·44 cub. yd. Overburden (Maschinenfabrik B. R. Wolf A.-G.), 406*
Dredging Crane, Steam (Ransomes & Rapier, Ltd.), 501*
— Operations, Southampton Dock Extensions, 612*
Dresden, Prof. D., on Sharp Corners, 451*
Drewry Car Co., Ltd., 300-h.p. Petrol Locomotives, 676*
Drier, Acetylene (C. S. Milne & Co., Ltd.), 355*
— Centrifugal, for Crystalline Materials (B. Heastie), 686*
— Sand, Oil-Fired (Constructional Engineering Co., Ltd.), 551*
— Wilton, Coke-Oven and Recovery Plant, Iriam, 540*
Drills and Drilling Machines. See *Machine Tools*
— Grinding Machine. See *Grinding Machine* under *Machine Tools*
"Drum" Engineering Co., Ltd., Valveless Rotary Pumps, 460*
Drum, Forged, 50-in. (T. Firth & J. Brown, Ltd.), 214
— — for Stirling Boilers, New Blackburn Meadows Power Station, 457
— Welded (J. Thompson (Wolverhampton), Ltd.), 215
— — Steel, Testing of, 328*
— Welding of, 447
Dry Dock. See *Dock*
— Rot of Timber, Investigations of, 637
Drying Plant, Grain, in Canadian Granaries, 144
Drysdale & Co., Ltd., Wee-Mac Self-Priming Pump, 202*; Wee-Mac Portable Pumping Set, 700*
du Pasquier, A. E., the Late, 578
Du Plat-Taylor, M., Adjustable Groyne, 686
Ductility and Stress-Strain Diagrams, Lead Alloys, 315*
Duddell Medal, Award to W. Gaede, 164, 650
Dufour, H., Alluvial-Matter Eliminators, 480
Dunston Power Station, 155*
Duralumin, Properties at Elevated Temperatures, 327, 342*
Durst, C. S., on Intrusion of Air into Anticyclones, 637; on Wind Structure over Different Surfaces, 652
Dusseldorf Conference, International Federation of National Standardising Associations, 136
Dust Removal from Blast-Furnace Gas, 502, 541
Dynamos. See *Generators, Electric; Turbo-Generators*
Dynamometer, Tool (Schiess-Defries A.-G.), 294*
Dynatron Wavemeter, 168*

E.

EARTH Resistance of Transmission Towers, 145*. See *Addendum*, 250
— Tester, Megger (Evershed and Vignoles, Ltd.), 77*
Earthquakes, New Zealand, Effect on Engineering Structures, 478
East Africa, Economic Conditions in, Report, 584
Economic Advisory Council, Report on Severn Barrage Scheme, 307, 394*, 599
— Conference, World, Opening of, 654
Economics for Engineers (Review), 239
— Industrial. See *Labour*
— Railway. See *Railway*
Economisers, New Blackburn Meadows Power Station, 457
Ecuador, Economic Conditions in, Report, 466

Education:

Board of Education, Courses for Teachers in Technical Schools, 218
Bradford Technical College, Lectures on Welding, 79
British Association for Commercial Education, Aims of, 523
Cambridge University Engineering Department Extensions, 117*; Busk Studentship in Aeronautics, 622
Education for Commerce, 523
Electrical Engineers, Institution of, Ferranti, Duddell, Swan, and Thompson Scholarships, 518
Faraday House Electrical Engineering College, Faraday and Maxwell Scholarships, 356
Manchester Municipal College of Technology, Scholarships at, 462; Summer Evening Courses in Technology, 596
Mechanical Engineers, Institution of, Revision of Examination Regulations, 360
Naval Architects, Education of, 114
— — Institution of, Scholarships in Naval Architecture, 14
Polytechnic, London, Lectures on Illumination, 74
Structural Engineers, Institution of, Portland House Travelling Scholarship, 391
Training of the Engineer for Management, 75. See LETTERS, 129, 170
University College, London, Faculty of Engineering, Courses in, 250
— of London, New Headquarters, Bloomsbury, 709
Westminster Technical Institute, Extension of, 226*
See also PARAGRAPH INDEX
Edwards, Capt. L. N., on Evolution of American Bridges, 389
Edwards, W., & Co., Vacuum Pumps, 166; High-Frequency Generator, 166
Effluents from Beet-Sugar Factories, Treatment of, 386
Egan, A. L., on Safety Catches for Vertical Mine Shafts, 426*
Egerton, A., on Properties of Saturated Steam, 707
Egypt, Upper, Electrical Irrigation in, 60
Egyptian Railways, History and Development of (Review), 643
Ejectors, Air, Production of Vacuum by, Experiments on, 230*, 255*, 262*
Elbourne, E. T., on Training Engineers for Management, 75. See LETTERS, 129, 170
Elder Dempster & Co., Ltd., *versus* Rudd, 682

Electric:

Accumulators, Lead-Acid (Block Batteries, Ltd.), 288
Alternator. See *Generator* and *Turbo*
Arc Control in Circuit Breakers, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
— Furnace. See *Furnace, Electric*
— Welding. See *Welding*
Battery. See *Accumulator* (above)
Bridge, Soil-Conductivity (Cambridge Instrument Co., Ltd.), 50*
British Electrical and Allied Industries Research Association, Report, 352
— Researches on Saturated Steam, 707
— — and Allied Manufacturers' Association, Annual Report, 390; Annual Dinner, 575; Work of, 601
— — Development Association, Annual Luncheon, 334: Reorganisation, 627
Bus Bars, Specification, 678
Cables, 66-kV, Battersea Power Station, 153
— Manufacturing Film, 100
— Paris Metropolitan Railway, 371*
— for Soil Heating, 92, 671*
Calculating Machine, Mallock (Cambridge Instrument Co., Ltd.), 567*
Cells, Photo-Electric, Exhibition, 387
Central Electricity Board, Tests of Earth Resistance of Power Transmission Towers, 145*. See *Addendum*, 250; Annual Report, 411
Cleaners, Electric, for Blast-Furnace Gas, 502, 541
Clocks, Electric, Mains-Operated, Specification, 399
Conductivity of Aluminium, 327, 473*
— of Metals at Low Temperatures, 165
Conductors for Road Lighting, 12
Control Cabinets (General Electric Co., Ltd.), 273*
Cranes. See *Cranes*
Dielectrics, Researches on, 352
Discharge Tubes, Luminous, Regulations for Installing, 434
Dynamo. See *Generator; Turbo-Generator*
Earth Resistance of Transmission Towers, Tests, 145*. See *Addendum*, 250
— Tester, Megger (Evershed & Vignoles, Ltd.), 77*
Electrical Apparatus, Canadian Standard Code, 223. See *Errata*, 249
— — Physical Society's Exhibition, 40*, 77*, 94*, 166*
— — Royal Society Conversazione, 566*, 602*
— Distribution in Great Britain, Cost of, 253. See LETTER, 364
— Equipment, Hungarian State Railway Locomotives, 58*, 296*, 349*
— Industry, Position and Prospects, 92
— Laboratory, Cambridge University Engineering Department, 118*
— Machinery, Imports and Exports, 92

Electric—*continued*.

Electrical Machinery, Noises from, Acoustics Laboratory for Researches on, 562*
— Plant, Use in Civil Engineering Works, 632
— Supply Industry and Research, 223
Electricity and Magnetism, Theory of (Review), 107
— Supply Commission, South Africa, Ten Years' Work of, 665
Electro-Magnetic Waves, Travel of, 494
Electro-Matic System of Traffic Control, Trafalgar Square, London, 388*. See 596
Electrode Production for Aluminium Furnaces, 592, 633*
Electroplating. See *Electro*
Fans, Ceiling, Specification, 679
Floodlight, Portable, for Aerodromes (Chance Brothers & Co., Ltd.), 661*
Frequency Meters (Everett, Edgcumbe & Co., Ltd.), 77*
— Standardisation, Progress, 411
Furnaces. See *Furnaces*
Fuse and Distribution Board, Weatherproof (English Electric Co., Ltd.), 273*
Galvanometer, Pot (Cambridge Instrument Co., Ltd.), 49
Generating Stations. See *Power Stations*
Generator. See *Generator* and *Turbo*
Heaters, Immersion, for Hot-Water Storage (General Electric Co., Ltd.), 14
Heating, Electric, Economics of, 284*. See LETTERS, 338*
— — and Gas, Comparisons, 618
— Panels (F. Braby & Co., Ltd.), 271
High Potentials, Apparatus for Producing, 283
— Tension Conference, International, Paris, 99
— — Research Apparatus, Massachusetts Institute of Technology, 688*
Hydro-Electric Power Plants. See *Power Plants*
Inductance-Matching Apparatus (H. W. Sullivan, Ltd.), 168*
Induction Coil, Theory and Application (Review), 4
— Furnace. See *Furnace, Electric*
— Motors. See *Motors, Electric*
Instruments for Electrically-Propelled Ships, 236
— Switchboard, Small-Case (Metropolitan-Vickers Electrical Co., Ltd.), 571
Insulating Materials (Telegraph Construction and Maintenance Co., Ltd.), 169
— — Thermal Conductivity of, 537
Irrigation, Electrical, in Upper Egypt, 60
Lamps, Hot-Cathode Tube (General Electric Co., Ltd.), 369*
— Miners,' Illumination from, 619
— for Railway Signalling, Specification 179
— for Road Lighting, 12
— Sodium Vapour (C. Zeiss (London), Ltd.), 79
— Tungsten-Filament, Specification, 30
Locomotives. See *Locomotives, Electric*
Machines. See *Generators; Motors; Turbo*
Mains. See *Cables* (above)
Meters, Frequency (Everett, Edgcumbe & Co., Ltd., 77*
— Polyphase, Portable Testing Set for (Chamberlain & Hookham, Ltd.), 59
— Power Factor (Elliott Brothers (London), Ltd.), 51*
— Prepayment (Ferranti, Ltd.), 215*
Motors. See *Motors, Electric*
Oil Switch. See *Switchgear*
Oscillographs, Cathode-Ray (Standard Telephones & Cables, Ltd.), 167, 602
Phase Advancer, Three-Phase (Laurence, Scott & Electro-Motors, Ltd.), 249
— Converter, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*
Photo-Electric Cells, Exhibition at Science Museum, 387
Plugs and Sockets, Flame-Proof, Specification, 680
Pole Changer, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*, 350*
Potential Transformers, New Blackburn Meadows Power Station, 381*
Potentiometer, Portable (Elliott Brothers (London), Ltd.), 52
Power. See *Power*
— Stations. See *Power Stations*
Pyrometer. See *Pyrometer*
Railways. See *Railways*
Rectifiers, Metal (Westinghouse Brake & Saxby Signal Co., Ltd.), 169
Relays, Overload (G. Ellison, Ltd.), 216*
— Protective, for Induction Motors (Nalder Brothers & Thomson, Ltd.), 95*
— Tractive Armature, Specification, 709
Resistance Materials, Telcon (Wild-Barfield Electric Furnaces, Ltd.), 97
— of Metals at Low Temperatures, 165
— Welding. See *Welding*
Rheostat, 1-25,000 ohm (Ward Leonard Electric Co.), 196
Röntgen Rays. See *Röntgen*
Ship Propulsion. See *Marine Propulsion*
Signs, Electric, Regulations for Installing, 434
Sockets and Plugs, Flame-Proof, Specification, 680
Soil-Heating Cables, 92, 671*
Starter, Liquid, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*, 350*
— Motor. See *Motors, Electric*
Steel Manufacture. See *Metallurgy; Furnace, Electric*
Storage Battery. See *Accumulator* (above)
Street Railways. See *Tramways*
Substation. See *Substation*
Switchgear. See *Switchgear; Motors, Electric*
Telegraphy. See *Telegraphy*
Telephony. See *Telephony*
Test Sets, Multi-Range (Ferranti, Ltd.), 216

Electric—*continued.*
Tester, Continuity (Record Electrical Co., Ltd.), 95*
Testing Equipment for Motor-Car Engines, 421*
Thermometer. See *Thermometer*
Traction. See *Locomotives, Electric; Railways; Tramways*
Tramways. See *Tramways*
Transformers. See *Transformers*
Turbo-Generators. See *Turbo-Generators*
Voltmeter, Harmonic (Everett, Edgcumbe & Co., Ltd.), 77*
Wavemeter, Dynatron (H. W. Sullivan, Ltd.), 168*
Welding. See *Welding*
Winding Gear. See *Winding*
Wireless Telegraphy. See *Telegraphy*
— Telephony. See *Telephony*
X-Rays. See *Rontgen Rays*
See also PARAGRAPH INDEX
Electric Resistance Furnace Co., Ltd., Transformer-Sheet Annealing Furnace, 285*

Electrical Engineers, Institution of :
Post-War Developments in High-Pressure Boilers, by C. H. Davy and C. H. Sparks, 11
Economic Problem of Swedish State Railway Electrification, by I. Ofverholm, 133, 449*
Annual Dinner, 224
Cost of Electricity Supply and Distribution in Great Britain, by J. M. Kennedy and D. M. Noakes, 253
Regulations for Installation of Electric Signs and Luminous Discharge Tubes, 434
Kelvin Lecture on Travel of Wireless Waves, by Sir F. Smith, 494
Ferranti, Duddell, Swan, and Thompson Scholarships, 518
Conversazione, 704
Western Centre:
Annual Dinner, 48
Electrical Distribution in Great Britain, Costs of, 253. See LETTER, 364
— Engineering in 1932, 202
— — and Metallurgical Research, 447
— — in Russia, 476
— Machinery, Noises from, Acoustics Laboratory for Research, 563*
Electricity Commissioners. See under *Electric*
Electrodes for Arc Welding, 419, 442
Electrofio Meters Co., Ltd., Pyrograph Recorder, 242*
Electrolysers, High-Pressure, for Hydrogen Manufacture, 399
Electrolytic Corrosion. See *Corrosion*
Electromatic Oil-Fuel Burner (G. C. Pillinger & Co., Ltd.), 186
Electro-Matic System of Traffic Control, Trafalgar Square, London, 388*. See 596
Electro-Mechanical Brake Co., Ltd., Compressed-Air Plant for New Blackburn Meadows Power Station, 378*
Electrons and Waves (Review), 123
Electroplating Apparatus, Chromium (W. Canning & Co., Ltd.), 270*
— — Barrel, Bench (W. Canning & Co., Ltd.), 270*
— — Sherrite Steel Sheets, 584
Elements, Transmutation of, Researches on, 348
Elevators, Grain, Albany, Self-Supporting Arc-Welded Steel Roof over, 22*
— Grain, Canadian, 136, 141*, 199*, 568*
— 80,000-ton Granary, Bahia Blanca, 148*, 205*, 267*
Elliott Brothers (London), Ltd., Power Factor Meter, 51*; Precision Multiversal Current Transformer, 51*; Portable Potentiometer, 52; Temperature and Humidity Regulator, 52
Ellison, G., Ltd., Solenoid Overload Relays, 216*; Pole-Mounted Oil-Break Circuit Breaker, 216*
Embankment, Birkenhead Docks Extensions, 498*
Embrittlement, Chemical, Failures due to, 583, 663*. See *Erratum*, 596
Emery Wheels. See *Grinding* under *Machine Tools*
Emmet, W. L., Work on Electric Propulsion, 323
Emmett, C. C., on Lighting at the Coal Face, 619
Empire Timbers, Conference, 105; Investigations, 637
Employees. See *Labour*
Employers' Liability. See *Labour*
Employment. See *Labour*
Endurance Tests. See *Alternating Stress* under *Tests (Materials)*
Engines, Aero. See *Aeronautics*
— Boulton & Watt, in Cornwall, 440
— Diesel. See *Engines, Oil, Diesel. Marine Propulsion; Motor Ships*
— Fire. See *Fire Engines*
— Hydrogen, Erren, 259, 630
— — Thermal Efficiency of, 400
— Internal - Combustion, Exhaust - Valve Failures in, 580*, 615
— — Combustion, Steels for Valves of, 55*, 83*
— Locomotive. See *Locomotive*
— Motor-Car. See *Engines, Petrol*
— Oil, Diesel, 850-b.h.p. Eight-Cylinder for Mobile Power Houses, 328*
— — Diesel, 12-90 h.p. High-Speed (Ailsa Craig Motor Co.), 262
— — Diesel, for Locomotives and Rail Coaches, 455
— — Diesel, 260-b.h.p. Six-Cylinder, Brotherhood-Ricardo, 594*
— — Diesel, 220-b.h.p. Three-Cylinder, for 150-ton Floating Crane, 177*
— — Diesel, Troubles experienced with, 308. See LETTER, 299*
— — Diesel. See also *Motorships; Marine Propulsion; Diesel Engine Users' Association*
— — Flow in Injections Systems of, 715*
Engines, Oil, 72-b.h.p. Four-Cylinder (National Gas and Oil Engine Co., Ltd.), 124*. See *Addendum*, 288
— — Fuel-Injection Equipment for (Bryce, Ltd.), 128*
— — Fullagar-Diesel,2,500-b.h.p. Six-Cylinder, Trials of, 604*
— — History of (Review), 538
— — Marine, 6,000-h.p. Eight-Cylinder, M.S. "Oceania," 644*
— — Marine, 20-25 b.h.p. Four-Cylinder (J. & H. McLaren, Ltd.), 700*
— — Marine, 10,000-s.h.p., H.M. Submarine "Thames," 258*
— — Marine, 360-b.h.p. Six-Cylinder (Mirrlees, Bickerton & Day, Ltd.), 158*
— — Mechanical Breakdowns of, 488, 662
— — for Oil-Electric Locomotives, 79, 85*. See *Erratum*, 107
— — and Petrol, Evaporative Cooling Systems for, 79
— — 7-h.p. Single-Cylinder Two-Stroke, 312*. See *Addendum*, 331
— — 200-b.h.p. Six-Cylinder (Bellis & Morcom, Ltd.), 210*
— — 630-b.h.p. Six-Cylinder (National Gas and Oil Engine Co. Ltd.), 41*
— — 120-h.p. Six-Cylinder, Tests of (Tangyes, Ltd.), 204*
— — Sleeve-Valve, for Oil-Electric Locomotives, 79, 86*
— — Steels for Valves of, 55*, 83*
— — Two-Stroke Double-Acting,Water-Cooled Piston Rods for, 484
— — See also *Tractors* and PARAGRAPH INDEX
— Petrol, Aeroplane. See *Aeronautics*
— — 150-h.p. Eight-Cylinder, for Locomotives, 676*
— — Exhaust-Valve Failures in, 580*, 615
— — 10-h.p. Four-Cylinder, for Detachable Tractor, 633*
— — 17·5-b.h.p. Four-Cylinder, for Fire Engine (Gwynnes Pumps, Ltd.), 699*
— — Marine, for High Altitude (Swedish Penta Works), 15
— — Motor-Car, 11·9-h.p. Morris-Cowley, Starting Tests with, 300*, 374*. See *Errata*, 430
— — Motor-Car, Electrical Testing Equipment for (Humber-Hillman Motor-Car Co., Ltd.), 421*
— — 170-b.h.p. Six-Cylinder, for Motor Fire Escape, 666*
— — 115-h.p. Six-Cylinder (Sterling Engine Co.), 70*
— — Starting with Benzole, Petrol or Benzole-Petrol Mixtures, 300*, 374. See *Errata*, 430
— — Steels for Valves of, 55*, 83*
— — Troubles experienced with, 308. See LETTER, 299*
— — 4-h.p. Twin-Cylinder, Petter, 700*
— — See also *Aeronautics; Motor-Cars*
— Steam, Compound, Woolf's, 109
— — Marine. See *Marine Propulsion; Turbines*
— — Mechanical Breakdowns of, 489, 496, 554*, 582, 661*
— — Traction, Development of, 639*. See LETTER, 687
— — Traction. See also *Tractors*
— — Work of Trevithick on, 106, 440*, 459, 693*
— Water, for Acetylene Generator (C. S. Milne & Co., Ltd.), 354*
— Winding. See *Winding*
— See also PARAGRAPH INDEX
Engineering and Allied Industries, Position and Prospects, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
— and Building Contracts, Arbitration in, 547
— Centenaries, 19. See LETTER, 81
— Concrete (Review), 615
— Education. See *Education*
— Industrial, and Management (Review), 106
— Laboratories. See *Laboratories; National Physical*
— Noise Problems, Acoustics Laboratory for Researches on, 563*
— Practice, Radium in, 335, 340*
— Progress and World Trade, 282
— Quantities, Report on, 547
— Relationship to Metallurgy, 447
— Standards. See *Standards Institution*
— Societies. See *Institutions*
— Technology, British Institute of, Annual Dinner, 170
— Works. See *Works*
Engineers-in-Charge, Institution of, Annual Dinner, 361
— Education. See *Education*
— German Circle, 373
— Institutions. See *Institutions*
— and Shipbuilders in Scotland, Institution of, Electric Arc Welding in Ship Construction, by J. L. Adam, 359; Grampian Hydro-Electric Works: Loch Ericht Development, by A. S. Valentine, H.M. Gibb, and E. M. Bergstrom, 607
— Training for Management, 75. See LETTERS, 129, 170
English Electric Co., Ltd., Electrical Plant Construction in 1932, 203; Weatherproof Fuse and Distribution Board, 273*; 5-kVA Combined Switch and Transformer, 274*; Starters for Squirrel-Cage Motors, 274*; Electric Traction Equipment for Copenhagen Railways, 476*; Tests of 2,500-b.h.p. Six-Cylinder Fullagar-Diesel Engine, 604*; 6,600-kW Hydraulic Turbines and Generators, 635; 300-h.p. Petrol Locomotives, 676*; 25,000-kW Turbo-Generator, New Blackburn Meadows Power Station, 701*
Equalising System, Hydraulic, for Bucket Dredger-Excavator, 406*
Equation of State of Real Fluid, 439
Equilibrium Diagrams, Alloys. See *Metallurgy*
Erasing Machine, Electric (B. J. Hall & Co., Ltd.), 88*
Erdmann Kirchels, Bakelite Moulding Press, 481*; Pattern Punching Attachment for Presses, 481*
Ericht, Loch, Development, Grampian Hydro-Electric Scheme, 607
Erosion of Turbine Blading, 289*
Erren Hydrogen Engine, 259, 399, 630
Est Railway, Locomotive Performances on, 31
Estimate, How to (Review), 404
Estuary, Severn, Tidal Model of, Report on, 599. See 307, 394*
Etablissements J. Paris, 650-ton Marine Turntable Slipway, 559*, 629*
Ethyl Fluid, Effect on Internal-Combustion Engine Valves, 56*
Eupatheoscope (Cambridge Instrument Co., Ltd.), 50
Europe, Glass Industry in, 463
European and American Railways, Express Train Speeds on, 459
— Standardisation of Iron and Steel, 136
Eutectic Alloys. See *Alloys* under *Metallurgy*
Evans, N. L., on Desulphurisation of Cast Iron by Soda Ash, 59
Evaporating Plant for Alumina Production, 592
— — for Glucose Manufacture, 397*
Evaporation, Multiple-Effect, Principle of, 398
Evelyn J., Views on Smoke Abatement, 626
Evershed & Vignoles, Ltd., Megger Earth Tester, 77*; Distant Water-Level Indicator, 77*; Tests of Earth Resistance of Transmission Towers, 145*. See *Addendum*, 250
Everett, Edgcumbe & Co., Ltd., Precision Frequency Indicator, 77*; Harmonic Voltmeter, 77*
Evetts, G., on Gas Manufacture and Distribution in Belgium, 618
Ewing, Sir J. A., Award of Freedom of Dundee to, 656
Excavator, Bucket Dredger, 1·44-cub. yard Overburden (Maschinenfabrik B. R. Wolf, A.-G.), 406*
— ¾-yard Drag-Line (Ruston-Bucyrus, Ltd.), 248
— Electrical Drive for, 632
— Use in Clay Industries, 610
Exchanger, Heat, Grimsby Fish-Dock Ice-Making Plant, 648*
— — Vapour-to-Oil, Coke-Oven and Recovery Plant, Irlam, 540*
Exhaust Steam Turbine. See *Turbine, Steam*
— Valves. See *Valves*
Exhibition, Anglo-Palestine, Royal Agricultural Hall, 654
— British Industries Fair, Birmingham, 182*, 208*, 223, 240*, 269*. See LETTER, 275. See *Errata* 304, 305
— Chicago, "Royal Scot" Express Train at, 558
— Engineering, Institution of Civil Engineers' Conversazione, 685*
— German National Agricultural Show, Berlin, 670*
— International Foundry Trades, Royal Agricultural Hall, 486*, 549*
— — Oil Industries, 391
— Leipzig Fair, Machine Tools at, 293*, 323*, 400*, 451*, 481*. See *Erratum*, 388
— Model Railway Club, 470
— Photo-Electric Cells, Science Museum, 387
— Plastics Industry, Science Museum, 523
— Power and Mechanical Engineering, New York, 37*, 70*, 138*, 194*
— Royal Academy, British Art in Industry, 387
— — Agricultural Show, Derby, 698*
— Scientific Apparatus, Physical Society's, 49*, 77*, 94*, 166*, 261*
— — Apparatus, Royal Society Conversazione, 566*, 591*, 602
— Ship (Overseas Marketing Service, Ltd.), 334
— See also PARAGRAPH INDEX
Experimental Engine. See *Engine*
— Tank. See *Tank; Ship Resistance*
Explosion, Boiler. See *Boiler Explosion*
— Flames, Photographic Analysis of, 618
— Pot Design for Circuit Breakers, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
Explosives, Ignition of Fire Damp by, Report, 110
— Liquid-Oxygen, Report, 18
Export Trade. See *Trade;* and *Industries* in PARAGRAPH INDEX

F.

FACTORY Accidents. See *Accidents*
— Management. See *Works Management*
Falmouth, Newcomen Society Summer Meeting, 571, 713
Fans, Ceiling, Electric, Specification, 679
— Forced and Induced Draught, Battersea Power Station, 90
— — and Induced-Draught, New Blackburn Meadows Power Station, 457
— Turbine-Driven, for Condensing Locomotive, 517*
Faraday House Electrical Engineering College, Faraday and Maxwell Scholarships, 356
Farming. See *Agriculture; Tractors*
Fatigue, Failure by, 238. See LETTERS, 299, 459
— Resisting Properties of Aluminium Alloys, 327, 342*
— Tests of Metals. See *Alternating Stress* under *Tests (Materials)*
Feed Pumps. See *Pumps*
— Water Distillation System, Valenciennes Power Station, 116*
— — Heating, Introduction by Trevithick,459
— — Regulator, Three-Element (Bailey Meter Co.)., 672*
— — Softener. See *Water Softener*
— — System, S.S. "Conte di Savoia," 424
— — See also *Water*
Fell, Lieut.-Col. L. F. R., on Engines for Oil-Electric Locomotives, 85*. See 79. See *Erratum*, 107
Felton, A., Automatic Time Interval Counting Apparatus, 602
Ferguson, Pailin, Ltd., Pole-Mounted Switch Kiosk, 234*
Ferranti, Ltd., Miniature Current Transformer, 95*; 66-kV Transformers, Battersea Power Station, 152; Prepayment Electricity Meter, 215*; Multi-Range Current Test Sets, 216*
Ferro-Concrete Bins, 80,000-ton Granary, Bahia Blanca, 147*, 205*
— — Construction, Paris Metropolitan Railway, 63*, 122*
— — Deterioration in Sea Water, Report, 708
— — Granaries, Canadian, 136, 141*, 199*, 568*
— — Jetties for Marine Turntable Slipway, 560*
— — Jetty and Wharf, Battersea Power Station, 89*
— — Monoliths, Southampton Dock Extensions, 612*
— — Piling, Ford Motor Works, Dagenham, 169
— — Reservoir, Boughton, Chester, 576*
— — Slabs, Deformation and Cracking of, 686
— — Water Tower, Chester Waterworks, 577*
— — See also PARAGRAPH INDEX
Fiat Stabilimento Grandi Motori, 6,000-h.p. Marine Oil Engine, 644*
Field, A. J., on Conductivity of Aluminium Wire, 473*. See 327
Files, Millenicut (T. Firth & J. Brown, Ltd.), 214
Film Evaporator for Glucose Manufacture, 397*
— Oil, and Lubrication, 217, 275
Filter, Air, Drawer-Type (C. G. Vokes, Ltd.), 244*
— Beds, Flue-Gas Washing Plant, Battersea Power Station, 90*
Filtration Plant, Langham Waterworks, Essex, 711
Finance, Municipal, in United States, Report, 105
Flock, E. F., on Properties of Saturated Steam, 707
Fire Damp, Ignition by Explosives, Report, 110
— Engine, Trailer, Petrol-Driven (Gwynne's Pumps, Ltd.), 699*
— Escape, Motor Turntable (Merryweather & Sons, Ltd.), 666*
— Resistance of Building Materials and Structures, Definitions, 651
— Risk and Celluloid, 654
— in Ships, Prevention of, 49
Firebricks for Boiler Furnaces, Properties and Tests of, 4*, 34*
— Manufacture, Cost of Raw Materials in, 610
Firth, T. & J. Brown, Ltd., Millenicut Files, 214; 50-in. Forged Steam Drum, 214; Forged Boiler Drums, New Blackburn Meadows Power Station, 457
Fishenden, Dr. M., Heat-Transfer Measuring Apparatus, 568
Fista Poles for Power-Transmission Lines (Ashmore, Benson, Pease & Co., Ltd.), 273*
Flames, Explosion, Photographic Analysis of, 618
— Sensitive, and Sounding Plates, 523
Flanges, Pipe, Specification, 698
Fleming, F. A., Grimsby Fish-Dock Ice-Making Plant, 647*
Fleuss, H. A., the Late, 196
Floating Crane. See *Crane*
Floodlight, Portable, for Aerodromes (Chance Brothers & Co., Ltd.), 661*
Floodlighting of Acropolis, Athens, 357
Floods, Tidal, on River Thames, 255
Flooring, Wooden, Investigation of Decay, 637
Flory, H. G., Variable-Speed Gear for Counting Mechanisms, 686
Flow Controllers, Air-Operated (G. Kent, Ltd.), 209*
— — Magnetic-Clutch (C. F. Tagliabue Manufacturing Co.), 582*
— Meter, Mechanical (Brown Instrument Co.), 530*
— in Oil-Engine Injection Systems, Experiments on, 715*
— past Ship-Shaped Models, Experiments on, 469
— Syphon, Laws of, 115
Flue-Gas Scrubber (Riley Stoker Corporation), 70*
— — Washing Plant, Battersea Power Station, 90*
Fluid-Flow Ratio Regulator (Drayton Regulator and Instrument Co., Ltd.), 261*
— Motion, Viscous, Instability of, 389
— Real, Equation of State, 439
Flywheels, Investigation of Breakdowns of, 583, 662
Foden, E., Development of Traction Engine by, 641
Ford Motor Company, Electric Hardening and Tempering Furnace, 284; Foundations and Tunnels at Dagenham Works, 169
Fordath Engineering Co., Ltd., Sand Mixer, 487*; Rotary Core Machine, 487*
Forebay, Sivasamudram Hydro-Electric Scheme 2*
Forest Products Research Board, Report, 637; Researches in Woodworking, 27*
Forgings, Radiographic Examination, 335, 340
Forms, Moving, for Concrete Granary Construction, 136, 199
Foster Instrument Co., Continuous Chart Recorder, 95*; Foundry Pyrometer, 186
Foster, W., & Co., 8-h.p. Steam Traction Engine, 641*
Foster Wheeler Corporation, Axial-Flow Pump, 38*; Feed Controller for Ball-Mill Pulveriser, 70*
Föttinger, Dr. H., Work on Hydraulic Transmission, 323
Foundations, Battersea Power Station, 89*
— 80,000-ton Granary, Bahia Blanca, 148*
— Power-House, Ford Motor Works, Dagenham, 169
Foundry Equipment, Ltd., Roll-Over Moulding Machine, 549*; Moulding Machine for Flat Castings, 549*
— Patterns, Marking and Colouring, Specification, 140
— Trades' Exhibition, Royal Agricultural Hall, 486*, 549*
— See also *Castings; Moulding*
Foundrymen, British, Insitute of, Desulphurisation and Refinement of Cast Iron, by N. L. Evans, 59

Fowler, J., & Co., Development of Traction and Ploughing Engines by, 639*
Fox, J. R., on Progress of Water Supply, 691
Fractures, Investigations of, 488*, 490, 554*, 582, 661*
— in Shafts, Progress Chart of, 685
France, After-Hours Employment in, 48
— Basic Steel Process in, Jubilee of, 171. See 488, 674
— Ugine Steel Works, Dephosphorisation and Deoxidation of Steel, 488, 674. See 171
— — See also *French*
Francis Turbines. See *Turbines, Hydraulic*
Frémont, C., Memorial to, 542
French Institution of Civil Engineers. See *Civil Engineers*
— Locomotives, Performances of, 31*
— Power Stations, Use of ATV Steel Turbine Blading in, 290
— Railways, Motor-Driven Pneumatic-Tyred Carriages on, 653
— State Railway, Three-Cylinder Locomotive, 34*
— See also *France*
Friction Clutch. See *Clutch*
Frictional Resistance of Ships. See *Ship Resistance*
"Frida Sophia," Steam Trawler, Boiler Explosion in, 621
Froriep, Maschinenfabrik, G.m.b.H., Heavy Lathe, 39*
Frost, Effect on Tellurium-Lead Pipes, 310, 318
Fuel, Hydrogen as, Possibilities, 399
— Injection in Oil Engines, Experiments on Flow in, 715*
— Institute of, Meichett Medal awarded to Sir J. Cadman 679
— Liquid. See *Oil Fuel*
— Low-Temperature Carbonisation of Coal. See *Coal, Low-Temperature Carbonisation*
— Motor, Experiments on Ease of Starting with, 300*, 374*. See *Errata*, 430
— — Knock Ratings of, 465
— Oil. See *Oil Fuel*
— Pump. See *Pump*
— Research Board, Annual Report, 254; Report on Carbonisation of Coal of Relatively Low Coking Power, 717
— — Committee, Co-operative, United States, Investigations of Motor Fuels, 465
— Smokeless. See *Coal, Low-Temperature Carbonisation*
— See also *Coal; Oil; Gas; Pulverised Coal*
Fulham Corporation Power Station, 658
Fuller-Bonnet Pulverising Mill (Babcock & Wilcox, Ltd.), 269
Fulton-Syphon Co., Water Mixer, 138*
Fumes, Emission of, Battersea Power Station, 361
Fumifugium, John Evelyn's, Reprint of, 626
Furkert, F. W., on Earthquakes and Engineering Structures, 478
Furnaces, Blast, American, Development in, 501*, 541
— — Coke Consumption in, Effect of Breeze on, 525, 531*
— — External Heat Loss of, 526
— Boiler, Radiation in, 333. See *Erratum*, 389. See LETTER, 389
— — Refractories in, 4*, 34*
— — See also *Stoker*
— Electric, for Aluminium Production, 634*
— — Annealing (Electric Resistance Furnace Co., Ltd.), 285*
— — for Basic Steel Process, 172
— — Bright-Annealing, with Belt Conveyor (Birmingham Electric Furnaces, Ltd.), 185*
— — with Forced-Air Circulation (Birmingham Electric Furnaces, Ltd.), 248
— — with Forced-Air Circulation (Wild-Barfield Electric Furnaces, Ltd.), 97
— — for Industrial Purposes, 284*. See LETTERS, 338*
— — Resistance (R. M. Catterson-Smith), 97
— — Use in Steel Manufacture, 447
— — (Wild-Barfield Electric Furnaces, Ltd.), 248
— Electro-Magnetic, Temperature Control Chart for, 69*. See *Addendum*, 275
— Forge, Pulverised-Fuel Fired (A. Herbert, Ltd.), 242*
— Gas and Electric, Relative Costs, 338
— Metallurgical, Utilisation of Blast-Furnace Gas in, 504
— Oil-Fired Annealing (Burdons, Ltd.), 242*
— — Fired, for Brass Billets (J. F. Askam), 184*
— — Fired Heat-Treatment (Alldays & Onions, Ltd.), 186
— — Fired Heat-Treatment 'International Furnace Equipment Co., Ltd.), 213*
— — Fired, Heat Treatment (Manchester Furnaces, Ltd.), 242*
— — Fired, for Heating Bottle Necks (Swinney Brothers, Ltd.), 183*
— — Fired, 600-lb. Melting (British Reverberatory Furnaces, Ltd.), 185*
— — Fired Melting (Urquhart's (1926), Ltd.), 186
— — Fired, 3½-cwt. Semi-Rotary, Melting (Sir W. G. Armstrong, Whitworth & Co. (Engineers), Ltd.), 183*
— — Fired, 400-lb. Tilting Crucible Morgan Crucible Co., Ltd.), 183*
— Open-Hearth, for Basic Steel Process, 171
— Puddling, Working of, 525
— Steel, Researches on Linings of, 171
— See also *Coke Ovens*
Furness Shipbuilding Co., Ltd., Southampton Graving Dock Caisson, 697*
Fuse and Distribution Board, Weatherproof (English Electric Co., Ltd.), 273*

G.

GABB, G. H., Royal Society Thermometer Scales, 556
Gaede, W., Award of Duddell Medal to, 164, 650
Galleries, Shipping, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
Galvanometers. See *Electric*
Gans & Co., Ltd., Electrical Equipment, Hungarian State Railways, 58*, 296* 349*
Garage, Vertical, Model (H. Simon, Ltd.), 246*
Garrow, R. G., 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
Garston Gas Works, Liverpool, 618
Gas, Acetylene. See *Acetylene*
— Blast-Furnace, Cleaning Equipment for, 502, 541
— — Furnace, Utilisation of, 504, 541
— Coke Oven. See *Coke Oven*
— Compressor, High-Pressure (B. Donkin & Co., Ltd.), 211*
— — Steam-Driven (Belliss & Morcom, Ltd.), 210*
— Engineering Department, Westminster Technical Institute, 266*
— Engineers, Institution of, Liverpool Meeting, Programme, 570; Presidential Address, by R. E. Gibson, on Gas Industry, 617; Coke-Oven Plant at Beckton Gas Works, by R. W. Hunter, 617; Electrolytic Corrosion in Gas Mains, by Dr. W. Beck, 617; Photographic Analysis of Explosion Flames, by Prof. W. A. Bone, 618; Heating Buildings by Gas, by A. H. Barker, 618; Centralised Manufacture and Distribution of Gas in Belgium, by G. Evetts, 618; Development of Gas as Industrial Fuel, by J. E. White, 619
— Fired Furnaces. See *Furnaces*
— Heater (for Tools (W. Allday & Co., Ltd., 246*
— Heating Buildings by, 618
— as Industrial Fuel, 619
— Industry, Progress of, 617
Gas Light and Coke Co., Crystallisation of Ammonium Sulphate, 603; Coke-Oven Plant at Beckton, 617
— Mains, Coke-Oven and Recovery Plant, Irlam, 540*
— — Electrolytic Corrosion in, 617
— Manufacturers, Liabilities of, 282. See 390*. See LETTER, 389
— Mixing Tank, Spherical, Electrically-Welded, 688*
— Pipe Line, Belgium, 618
— Production from Northumberland Yard Seam Coal, 717
— Reactions on Copper-Nickel Alloys, 363
— Retorts, Brick, Experiments with, 254
— Works, Coke-Oven Plant in, 617
Gaseous Explosions, Photographic Analysis of, 618
Gases, Low-Temperature Researches on, 104, 133, 165, 193
Gasholder, Neunkirchen, Explosion of, 282, 390*. See LETTER, 389
Gasoline. See *Petrol; Engine, Petrol; Carburettors; Aeronautics*
Gates, Platform, Paris Metropolitan Railway, 320*
Gauge, Dial, External and Internal (C. Mahr, G.m.b.H.), 482*
— Pressure, Calibration of, 707
— Screw-Thread (C. Mahr, G.m.b.H.), 482*
— Water, Bi-Colour (Dewrance & Co.), 602*
Gear Box for Fine-Turning Lathe (G. Kärger), 293*
— — Wilson-Drewry, for Petrol Locomotives, 676*
— Cutting Machines. See *Machine Tools*
— Differential. See *Motor-Car Details*
— Helical, Double-Reduction, S.S. "Santa Rosa," 112
— Reduction, Radicon Worm (D. Brown & Sons (Huddersfield), Ltd.), 594*
— Steering. See *Steering*
— Transmission, for Electric Locomotives, Hungarian State Railways, 59*
— — for Oil-Electric Locomotives, 79
— Variable-Speed, for Integrating and Counting Mechanisms, 686
Geared Turbines, Marine. See *Marine, Propulsion*
Geipel, W., Ltd., Mechanical Hammer Drill, 204
General Electric Co. of America, 6,000-kW Alternators, Sivasamudram, 3*
General Electric Co., Ltd., Electric Immersion Heaters, 14; Equipment for Overhead Line Power Transmission System, Upper Egypt, 60; Electrical Plant Construction in 1932, 203; Transmission Towers and Earth Resistance, 145.* See *Addendum*, 250; 650-kW High-Tension Boiler, 272*; Control Cabinets, 273*; Floodlighting of Acropolis, 357; Hot-Cathode Tube Lamps for Street Lighting, 369*; Compressed Air-Operated Switchgear, New Blackburn Meadows Power Station, 378*; Testing Equipment for Motor-Car Engines, 421*; Generating Plant, West Regional Broadcasting Station, 542*; Underground Railway Stations, Lighting Fittings, 675; Non-Glare Reflectors, for Road Lighting, 679; Electric Motors for Southampton Graving-Dock Pumping Plant, 697*; Electrically-Operated Sterilising Chest, 700*
General Wharfage & Supply Co., Motor Tug "Crowstone," 158*
Generating Station. See *Power Station*
Generators, Acetylene (C. S. Milne & Co., Ltd.), 353*
— Electric, 80,000-kVA. Battersea Power Station, 91*, 585*, 667*
— — 850-kW, "Conte di Savoia," 426*
— — 50,000-kW, Dunston Power Station, 156*
— — High-Frequency (W. Edwards & Co.), 166
— — 20,000-kVA, Loch Ericht Hydro-Electric Scheme, 608
— — 6,600-kW, Lochaber Hydro-Electric Scheme, 635
— — 570-kW, for Mobile Power Houses, 328*
— — 25,000-kW, New Blackburn Meadows Power Station, 701*
— — 115-h.p. Petrol-Driven (Sterling Engine Co.), 70*
— — for Ship Propulsion, Control of, 236
— — 6,000-kW, Sivasamudram Hydro-Electric Scheme, 3*
Generators, Electric. See also *Turbo-Generators*
— Motor-Driven, 12,000-volt Direct-Current, for Rugby Radio Station, 25*
Geological Survey, United States, Report on Nitrate Deposits, 21
Georgetown, British Guiana, Drainage of, 417
German Battleship "Prinz Regent Luitpold," Salvage of, 545
— Circle, Engineers', 373
— Machine Tool Design, Tendencies in, 293
— National Agricultural Show, Berlin, 670*
— Symbols for Welding, 479*
Germany, Leipzig Fair, Machine Tools at, 293*, 323*, 400*, 451*, 481*. See *Erratum*, 388
— Neunkirchen Gasholder Explosion, 282, 390*. See LETTER, 389
— Sewage Treatment in, 163
— United Steel Works, Tests of Welded Steel Drums, 328*
Gestra Steam Trap (S. R. Golding & Co.), 691*
G.G.G. Self-Priming Pump, 471*
Gibb, H. M., on Grampian Hydro-Electric Scheme, 607
Gibb, Sir A., on Water Power in Great Britain, 24
Gibson, Prof. A. H., on Surge-Tank Investigations, 116; Report on Tidal Model of Severn Estuary, 599. See 307, 394*
Gibson, R. E., on Gas Industry, 617
Giffen, Dr. E., on Flow in Oil-Engine Injection Systems, 715*
Gilbert, Gilkes & Gordon, Ltd., Self-Priming Pump, 471*
Gilchrist, P. C., Work on Basic Steel Process, 171
Gilliford, F. H., on Development of Traction Engines, 639*. See LETTER, 687
Gilman, F. (B.S.T.), Ltd., Grinding and Polishing Machine, 210*; Tube-Brushing and Burnishing Machine, 210*; Treadle-Operated Grinding Machine, 210*
Ginnings, D. C., on Properties of Saturated Steam, 707
Girders, Vibrations in, Method of Minimising, 445*, 485
Glands, 67,200-kW Steam Turbine, 585*
Glass Industry in Europe, 463
— Optical (Chance Brothers & Co., Ltd.), 166
— Safety, Manufacture of (Triplex Safety Glass Co., Ltd.), 173
— Technology, Society of, Glass Industry on the Continent, by Prof. W. E. S. Turner, 463; Toughened Plate Glass, by J. Meikle, 527
— Toughened, Properties and Manufacture of, 527
Glasspoole, Dr. J., on Rainfall of British Isles, 1820–1929, 637
Glenfield & Kennedy, Ltd., Valves, Sivasamudram Hydro-Electric Scheme, 3*; Valves for Southampton Graving Dock, 608*
Glover, W. G., 650-ton Marine Turntable Slipway, 559*, 629*
Glucose, Manufacture of, 237*, 397*
Golding, S. R., & Co., Gestra Steam Trap, 691*
Goode, E. J., Compound Traction Engine, 642*
Gothenburg Harbour, Coal-Discharging Plant, 687*
Gough, Dr. H. J., on Corrosion-Fatigue Tests, 542
Governor, Deceleration, for Winding Engines (Metropolitan-Vickers Electrical Co., Ltd.), 114*
— Gear, Steam Turbines, 667*, 701*
— for Hydraulic Turbines, Sivasamudram Hydro-Electric Scheme, 3*
Graff-Baker, W. S., on Electric Rolling Stock, 226
Grain Elevators, Albany, Self-Supporting Arc-Welded Steel Roof over, 22*
— Handling Plant, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
— — and Storing of, 136, 141*, 199*, 568*
— Weighing Machine, 12,000-lb. Automatic (W. & T. Avery, Ltd.), 568* See 136, 141*, 199*
Grampian Hydro-Electric Scheme, 24,000-h.p. Turbines, 511*; Loch Ericht Development, 607
Granaries, Canadian, 136, 141*, 199*, 568*
— 80,000-ton, Bahia Blanca, 147*, 205* 267*
Graphitic Silicon in Aluminium, Determination of, 327
Grates. See *Furnace; Stoker*
Graving Dock. See *Dock*
Gray, F., Variable-Speed Gear for Integrating Mechanisms, 686
Great Britain, Electrical Distribution in, Costs of, 253. See LETTER, 364
— — Sewage Treatment in, 163
— — Water Power in, Future of, 24
Great Western Garden Villages Society, Ltd., *versus* Absalom 547
— — Railway, Developments on, 574
Green, A. T., on Permeability of Refractory Materials to Gases, 610
Green, T., & Sons, 10-ton Steam Roller, 642*
Gregson, Major W., on Water-Tube Boilers for Cargo Ships, 333. See *Erratum*, 382. See LETTER, 389
Griffin & Tatlock, Ltd., Bomb Calorimeter, 96*
Griffiths, Dr. E., on Thermal Insulation, 536
Grimsby Ice Co., Ltd., Ice-Making Plant, 647*
Grinder, Agricultural, Motor-Driven, 671*
Grinding Machines. See *Machine Tools*
Grogan, J. D., on Influence of Volatile Chlorides on Magnesium and Copper, 675. See 363
Groyne, Adjustable (M. Du Plat-Taylor), 686
Guards for Power Presses (J. Broughton), 270*
Guillet, Dr. L., on Basic Steel Process, 171
Gun Shield, 6-in. (Hadfields, Ltd.), 638* See 557, 589
Gunboats. See *Warships*
Gunther, Dr. R. T., Early English Scientific Instruments, 566. See 533*
Gwynnes Pumps, Ltd., Centrifugal Pumps for Southampton Graving Dock, 697*; Petrol-Driven Pumping Set, 699*
Gyromatic Vertical Automatic Lathe, 619*
Gyroscopic Stabilisation of Ships, 53, 107, 345*, 470, 507*, 578. See *Erratum*, 596

H.

HACKSAW Frames, Adjustable (J. Neill & Co. (Sheffield), Ltd.), 556*
Hacksawing Machine. See *Machine Tools*
Hadfield, Sir R., Exhibits at Royal Society Conversazione, 566
Hadfields, Ltd., Crushing Plant for Metur Dam, 55; ATV Steels, 289*; Large Steel Castings, 638*. See 557, 589
Hague, R. L., on Performances of Oil Tankers, 113
Hahn und Kolb, Universal Lapping Machine, 325*; Precision Boring Machine, 400*
Haigh, Prof. B. P., on Interpretation of Tensile Tests of Lead Alloys, 314*. See 311; on Tests of Electrically-Welded Joints, 422; Fatigue-Testing Machine for Wire, 567*
Halifax, Nova Scotia, Sea-Water Corrosion Experiments at, 708
Hall, B. J., & Co., Ltd., Electric Erasing Machine, 88*
Hall, J. & E., Ltd., Refrigerating Plant, Grimsby Fish Dock, 647*
Hamburg-Amerika Line, Furnace Water-Walls for Marine Boilers, 12*; Benson Boiler, S.S. "Uckermark," 112
Hammers. See *Machine Tools*
Handforth, J. R., on Internal-Combustion Engine Valves, 55*, 83*
Handling Equipment for American Blast Furnaces, 503*
— Plant, Coal and Ash, New Blackburn Meadows Power Station, 456*
— and Storing of Grain, 136, 141*, 199*, 568*
Hansen, H., on Specific Heat of Steam, 707
Harbour, Gothenburg, Coal-Discharging Plant, 687*
— Montreal, 12,000-lb. Automatic Grain-Weighing Machine, 568*. See 136, 141*, 199*
— Sydney, Timber Destruction by Marine Organisms, 104
— See also PARAGRAPH INDEX
Harco Patent Metalace (G. A. Harvey & Co. (London), Ltd.), 246*
Hardening Metals. See *Heat Treatment* under *Metallurgy*
Hardness Tests. See *Tests (Materials)*
Harland Engineering Co., Ltd., 11-kV 300-ampere Circuit Breaker, 249*; Truck Type Switchboard, 249*; Current Transformer, 275*
Harnischfeger Corporation, P. & H. Stump Puller, 475*; 300-ton Overhead Travelling Crane, 416*
Harris, P., on Research in Woodworking, 27*
Harrison's First Marine Timekeeper, 306
Harvey, G. A., & Co. (London), Ltd., Woven Wire Meshing, 246*
Hatfield, Dr. W. H., Award of Bessemer Medal to, 524; Exhibits at Royal Society Conversazione, 566
Haulage Gear for 650-ton Marine Turntable Slipway, 629*
Hauptner, M., Motor-Driven Clipping Machine, 671*
Haveaux, M., on Feed-Water Distillation System, 116*
Haven, W. A., on American Blast-Furnace Practice, 501*. See 541
Hawksley, T. E., on Southend Waterworks, 692
Hawthorn, Leslie & Co., Ltd., Trials of Portuguese Sloop "Gonçalo Velho," 108
— Sloops for Portuguese Navy, 704
Hazledin & Rastrick, Locomotive Construction by, 694*
Heap, A. C., on Diesel-Engined Locomotives and Rail Coaches, 454
Heastie, B., Centrifugal Dryer for Crystalline Materials, 686*
Heat Engines. See *Engines; Turbines Aeronautics*
— Exchanger, Grimsby Fish Dock Ice-Making Plant, 648*
— — Vapour-to-Oil, Coke-Oven and Recovery Plant, Irlam, 540*
— Insulating Materials, Efficiency of, 536
— Laboratory, Cambridge University Engineering Department, 118*
— Loss, External, from Blast Furnace, 526
— Specific. See *Specific Heat*
— Transfer Measuring Apparatus, 568
— Transmission in Boilers, 333. See *Erratum*, 382. See LETTER, 389
— Treatment of Metals. See *Metallurgy*
Heater, Feed-Water. See *Feed Water*
— Final, Coke-Oven and Recovery Plant, Irlam, 540*
— Gas, for Tools (W. Allday & Co., Ltd.), 246*
Heating Appliances (British Trane Co., Ltd.), 271
— Buildings by Gas, 618
— Curves, Alloys. See *Metallurgy*
— Electric, Economics of, 284*. See LETTERS, 338*
— Gas and Electric, Relative Costs, 338
— and Ventilating System, Tootal, Broadhurst, Lee & Co.'s Showroom, Manchester, 434
Heaviside Layer, Effect on Travel of Wireless Waves, 494
Hegenscheidt, W., Universal Wheel Lathe, 294*; Power-Driven Grinding Head, 295*
Heinze, E. P. A., Erren Hydrogen Engine, Demonstration, 630. See 259, 399
Hele-Shaw Beacham Hydraulic Telecontrol Gear, 591*
Helical Gears. See *Gears*
Helium, Liquefaction of, 105, 135, 165, 193
Heller, Gebr., Cold Metal Sawing Machine, 453*
Hematite Prices. See *Metal-Price Diagrams*
Henschel und Sohn A.-G., 2-8-2 Type Condensing Locomotive, 517*
Henshaw, A. M., the Late, 108
Herbert, A., Ltd., Motor-Driven Atritor Pulveriser, 242*; Pulverised-Fuel Forge Furnace, 242*; Wee-Mac Portable Pumping Set, 700*

Herbert, E. G., Ltd., Light Hacksawing Machine, 342*
Heterogeneity in Solids, Effect on Stress Distribution, 695*
Hewitt, T., on Reaction between Steam and Molten Copper, 363
Higgs Motors, Fractional Horse-Power Motors, 418*; Witton Works, 710*
High-Speed Steel. See *Steel*
— Temperature Tests. See *Tests (Materials)*
Highways. See *Roads*
Hilger, A., Ltd., Notched Echelon Cells for Spectrophotometry, 98*; Exhibits at Royal Society Conversazione, 567
History of American Bridges, 389
— of Naval and Marine Engineering, 321, 561, 657
— of Oil Engines (Review), 538
— of Use of Metals, 575
H.M.SS. See under *Warships*
Hobbing Machines, Gear. See *Machine Tools*
Hodgson, C. C., on Internal-Combustion-Engine Exhaust-Valve Failures, 580*. See 615
Hodgson, G. H., Microphotographs of Concrete, 686
Hodgson, J. L., Exhibits at Institution of Civil Engineers' Conversazione, 686
Hoffert, W. H., on Ease of Starting with Benzole and Petrol, 300*, 374*. See *Errata*, 430
Hoist, Skip, New Blackburn Meadows Power Station, 456*
Holbrook, E. A., on Ore Dressing and Coal Preparation, 665
Holden & Brooke, Ltd., Circulating Pump for Hot-Water Heating Systems, 448*
Holland, Zuyder Zee Reclamation, 309
Hong Kong, Motor Turntable Fire Escape for, 666*
Honours List, New Year's, 18
Hooghly River Tunnel, 41
Hoppers, Unloading, 80,000-ton Granary, Bahia Blanca, 150*, 206*
Hornsby, R., & Sons, 8-h.p. Steam Traction Engine, 641*
Horse Road Box, Double (Low-Loading Trailer Co.), 700*
Hortonsphere, Electrically-Welded, 688*
Hoseason, D. B., on Electric Motor Design, 191
Hot-Blast Stoves, American, 502*
Houghton, G. W., on Excess Lime Water Purification Process, 692, 711
Hours of Labour. See *Labour*
Howard, J. & F., Steam Ploughing Engine, 642*
— Lectures on Thermal Insulation, 536
Howden, T. C., & Co., 125-kg Hardness-Testing Machine, 505*
Howson, L. R., on Sewage Treatment in America, 163
Hudson, R., Ltd., Concrete-Pouring Skip, 212*
Hughes, Dr. G., on Effect of Wind on Ship Performance, 467
Hughes, H., & Son, Ltd., Marine Echo-Sounding Gear, 96; Aircraft Instruments, 97
Humber-Hillman Motor Car Co., Ltd., Testing Equipment for Motor-Car Engines, 421*
Humidity Controller (Negretti & Zambra), 166*
— and Temperature Regulator (Elliott Brothers (London), Ltd.), 52
Hummel, A., Söhne, Agricultural Disintegrator, 671*
Humphreys, G. H., on Drainage of Georgetown, British Guiana, 417
Hungarian State Railways, Kandó System of Electric Traction, 58*, 296*, 349*
Hunt, T. M., on Wind Direction in British Isles, 652
Hunter, R. W., on Coke-Oven Plant at Beckton, 617
Hurst, J. E., on Phosphorus in Hardened Cast Iron, 590
Hurth, C., Pedal-Operated Bar-Straightening and Bushing Presses, 453*
Hutchinson, Prof. W. S., on Coal and Petroleum in United States, 664
Hydraulic Equalising System, Bucket Dredger-Excavator, 406*
— Machine Tools. See *Machine Tools*
— Power Plant. See *Power Plant*
— Press. See *Press* under *Machine Tools*
— Pumps. See *Pump*
— Telecontrol Gear, Hele-Shaw Beacham, 591*
— Tilting Gear for 650-ton Marine Turntable Slipway, 561*
— Turbines. See *Turbines; Power Plant*
Hydraulics Laboratory, Cambridge University Engineering Department, 118*
— Syphon Flow and Surge Tank Data, 115
Hydrodynamics, Flow in Hydraulic Turbines (Review), 669
— Fluid Motion, Viscous, Instability of, 389
— See also *Ship Resistance*
Hydro-Electric Power Plant. See *Power Plant*
Hydrofeed Cold-Sawing Machine (S. Russell & Sons, Ltd.), 209*
Hydrogen, Effect on Copper-Nickel Alloys, 363
— Engine, Erren, 259, 630. See 399
— as Fuel, Possibilities of, 399. See 259, 630
— Ion Meter (Cambridge Instrument Co., Ltd.), 50*
— Liquefaction of, 105,135
Hydrogenation, Bergius Process, Experiments on, 254

I.

ICE-MAKING Plant, Grimsby Fish Dock, 647*
— See also *Refrigeration*
Ignition of Fire Damp by Explosives, Report, 110
Illumination. See *Lighting;* and *Lamps* under *Electric*
Imhoff, Dr. K., on Sewage Disposal in Germany, 163
Impact Tests. See *Tests (Materials)*
Imperial Institute, Report, 1932, 655; Report on Borates, 647
Import Trade. See *Trade*
Impulse Turbines. See *Turbines*
Ionosphere, Investigation of, 602
Ions, Charged, Production and Measurement of, 283, 309
Incandescent Lamps. See *Lamps* under *Electric*
Inclusions in Steels, Investigation of, 528*, 589
Indexing, International, of Scientific and Technical Papers, 119
India, Jamshedpur Sewage Pumping Stations, 417
— Madras, Industrial Developments at Metur, 658. See 55*
— Metur Dam, Madras, 55*. See 658
— River Hooghly Tunnel, 41
— Rubber. See *Rubber*
— Sivasamudram Hydro-Electric Scheme, 1*
— Uhl River Hydro-Electric Scheme, Opening of, 308
Indian Railways, Progress of Electric Traction on, 133
Indicator Diagrams, 2,500-b.h.p. Six-Cylinder Fullagar-Diesel Engine, 604*
— Thermal Maximum-Demand (Crompton Parkinson, Ltd.), 94*
— Water-Level, Distant (Evershed & Vignoles, Ltd.), 77*
Induction Furnaces. See *Furnaces, Electric*
— Motor. See *Motor, Electric*
— See *Electric*
Industrial Accidents. See *Accidents*
— Agreements and Disputes. See *Labour; Labour Notes*
— Economics. See *Labour*
— Engineering and Management (Review), 106
— Furnaces. See *Furnaces*
— Management. See *Works Management*
— Notes. See *Labour Notes* under *Labour*
— Research. See *Research*
— Revolution in Scotland (Review), 613
Industry, British Art in, Royal Academy Exhibition of, 387
— Engineering and Allied, Position and Prospects, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
— Iron and Steel, Reorganisation of, 412
— Nickel, Canadian, Jubilee of, 413
— of Sheffield, 655
— Use of Metals in, 575
— See also *Trade* and PARAGRAPH INDEX
Inertia, Moments of, New Rules for, 508*
Infringement Action Threats, 365
Inglis, Prof. C. E., on Life and Work of Trevithick, 459. See 106, 439*, 463, 467; on Minimising Vibrations in Ships, 445*. See 485
Ingots, Copper, Distribution of Porosity in, 362
Injection Systems, Oil-Engine, Experiments on Flow in, 715*
Instantair Valve Coupling B.E.N. Patents, Ltd.), 717*
Institute of Transport. See *Transport*
— See *Institutions*
Institution, Royal. See *Royal Institution*
— Technical and Scientific, See *Agricultural Society, Royal; Arts, Royal Society of; Arts, Scottish Society of; Automobile Engineers, Institution of; Automotive Engineers, American Society of; Belfast Association of Engineers; British Association; Ceramic Society; Chemical Engineers, Institution of; Civil Engineers, French Society of; Civil Engineers, Institution of; Civil Servants, Professional, Institution of; Consulting Engineers, Association of; Diesel Engine Users' Association; Electrical Engineers, Institution of; Engineers in Charge, Institution of; Engineers and Shipbuilders in Scotland, Institution of; Foundrymen, British Institute of; Fuel, Institute of; Gas Engineers, Institution of; Glass Technology, Society of; Iron and Steel Institute, Junior Institution of Engineers; Manchester Association of Engineers; Marine Engineers, Institute of; Mechanical Engineers, American Society of; Mechanical Engineers, Institution of; Metals, Institute of; Meteorological Society, Royal; Mining Engineers, Institution of; Mining and Metallurgical Engineers, American Institute of; Mining and Metallurgy, Canadian Institute of; Mining and Metallurgy, Institution of; Naval Architects, Institution of; Naval Architects and Marine Engineers, American Society of; Newcomen Society; North-East Coast Institution of Engineers and Shipbuilders; North Staffordshire Institute of Mining Engineers; Petroleum Technologists, Institution of; Physical Society; Royal Institution; Royal Society; Rugby Engineering Society; Sheffield Society of Engineers and Metallurgists; Structural Engineers, Institution of; Water Engineers, Institution of; Whitworth Society*
Insulating Materials, Thermal Properties of 536
Integrating Mechanisms, Variable-Speed Gear for, 686
Internal-Combustion Engines. See *Aeronautics; Engines; Motor Cars; Motor Boats; Tractors*
International and Baltic Maritime Conference, Proposed Rationalisation of Shipping Tonnage, 438
— Chamber of Commerce, Vienna Meeting, Report on Mercantile Shipping Crisis, 600. See LETTER, 687
International Commerservice, Ltd., 7-h.p. Two-Stroke Oil Engine, 312*. See *Addendum*, 331
— Congress for Applied Mechanics, Cambridge, 1934, 709
— Federation of National Standardising Associations, Düsseldorf Conference, 136
— Foundry Trades' Exhibition, Royal Agricultural Hall, 486*, 549*
— Furnace Equipment Co., Ltd., Oil-Fired Heat-Treatment Furnace, 213*
— High-Tension Conference, Paris, 99
— Indexing of Scientific and Technical Papers, 119
— Oil Industries Exhibition, 391
— Technical Conference, on Motor Tyre and Rim Standardisation, 709
International Tonnage Measurement Regulations, Objections to Report on, 441
— Trade. See *Trade*
Inventor and his World (Review), 625. See LETTERS, 658, 687, 713
Iraq, Oil Production in, 664
Irlam, Coke-Oven and Recovery Plant, Lancashire Steel Corporation, Ltd., 539*
Iron Alloys. See *Metallurgy* and *Steel*
— Case Hardening. See *Heat Treatment* under *Metallurgy*
— Corrosion. See *Corrosion*
— Foundry. See *Foundry*
— Furnaces. See *Furnaces*
— Heat Treatment. See *Metallurgy*
— Manufacture. See *Furnaces, Blast; Metallurgy*
— Pig, Prices. See *Metal-Price Diagrams*
— Rolling Mills. See *Rolling Mills*
— and Steel Industrial Research Council, Report on Steel Castings, 557, 589, 638*
— — Industry, Reorganisation of, 412

Iron & Steel Institute:

Joint Autumn Meeting with Institute of Metals (1932):
Metallurgical Problems Arising from Internal-Combustion Engine Valves, by J. R. Handford, 55*, 83*
Appointment of New Secretary, 262

Spring Meeting, London:
Programme, 389
Report of Council, 524
Honorary Treasurer's Report, 524
Presentation of Bessemer Medal to Dr. W. H. Hatfield, 524
Presidential Address, by W. R. Lysaght, on Sheet Industry, 524
Reports of Discussions, 525, 541, 587, 615
Annual Dinner, 526
Memorial to C. Frémont, 542
Coke Consumption in Blast-Furnace Practice: Effect of Removal of Breeze, by D. F. Marshall and Prof. R. V. Wheeler, 531*. See 525
External Heat Loss of Blast Furnace, by D. F. Marshall, 526
Developments in American Blast-Furnace Design and Practice, by W. A. Haven, 501*. See 541
Structural Changes in Hypo-Eutectoid Steels on Heating, by Sir H. C. H. Carpenter and Dr. J. M. Robertson, 541
Comparative Corrosion-Fatigue Tests Employing Two Types of Stressing Action, by Dr. H. J. Gough and D. G. Sopwith, 542
Formation of Columnar Crystals in Steel Sheets after Normalisation, by F. Kinsky, 542
Study of Inclusions in Steel, by Prof. A. M. Portevin and R. Perrin, 528*. See 589. See *Erratum*, 552
Report of Steel Castings Research Committee, 557. See 589, 638*
Influence of Phosphorus on Properties of Hardened and Tempered Cast Iron, by J. E. Hurst, 590
Effect of Sulphur and Phosphorus on Corrosion of Iron, by Dr. J. Tronstad and J. Sejersted, 590
Internal-Combustion-Engine Exhaust-Valve Failures, by C. C. Hodgson, 580*. See 615
Study of Properties of Austenitic Steels, by Dr. L. B. Pfeil and D. G. Jones, 615
Intergranular Corrosion of 18/8 Austenitic Stainless Steels, by E. C. Rollason, 689*. See 615
Iron and Steel Production, Russian Programme, 288
— — Sheet Industry, History and Position of, 524
— — Standardisation of, European, 136
— — See also PARAGRAPH INDEX
— Tests. See *Tests (Materials)*
— Welding. See *Welding*
— See also *Cast Iron; Steel; Pig Iron; Metallurgy*
Irrigation, Electrical, in Upper Egypt, 60
— See also PARAGRAPH INDEX
Irving Iron Works Co., Open-Mesh Bridge Decking, 636*
Italia-Flotte Riunite, S.S. "Conte di Savoia," 345*, 423*, 507*, 606*, 650. See 54, 107, 470, 578. See *Erratum*, 596
Italy, Electricity Supply in, 174
— Economic Conditions in, Report, 174, 192
— Tuscan Steam Wells, Utilisation of, 522
I-T-E Circuit Breaker Co., Air-Break Circuit Breaker, 195*

J.

JACKSON, Major C. M., the Late, 170
Jacold, F., on Neunkirchen Gasholder Explosion, 390*. See 282. See LETTER, 389
James Dredging, Towage and Transport Co., Ltd., Southampton Dock Extensions, 612*
James Watt. See *Watt*
Jamshedpur, India, Sewage Pumping Stations, 417
Jarvis, C. L., Co., Flexible-Shaft Grinding Set, 71*; Tapping Head, 71*
Jenkins, R., on Arthur Woolf, 1766–1837, 109
Jetty, Ferro-Concrete, Battersea Power Station, 89*
— — Concrete, for 650-ton Marine Turntable Slipway, Lorient, 560*
— Loading, 80,000-ton Granary, Bahia Blanca, 147*, 267*
Jets, Steam, Production of Vacuum by, Experiments on, 230*, 255*, 262*
J. K. Welding Co., Self-Supporting Arc-Welded Steel Roof, 22*
Johnson, C. H., & Co., Ltd., Sludge Press, 577*
Johnson *versus* Latham, 626
"Johore Maru," S.S., Pulverised-Fuel Trials, 377*
Joint, Expansion, Self-Equalising (E. B. Badger & Sons, Co.), 195
Joint Rings, Gas-Filled (Wills Pressure Filled Joint Ring, Ltd.), 213
Jones, B., on Properties of Tellurium-Lead, 317*. See 310; on Interpretation of Tensile Tests of Lead Alloys, 314*. See 311
Jones, D. G., on Properties of Austenitic Steels, 615
Jones, Dr. P., on Copper-Aluminium Alloys, 327
Jones & Laughlin Steel Co., 1,000-ton Daily-Output Blast Furnaces, 501*
Jones (Machine Tools), Ltd., Six-Spindle Automatic Lathe, 619*
Jones, & Shipman, Ltd., Precision Twist-Drill Grinder, 266*
Jones, T. D., on Lighting at the Coal Face, 619
Journals. See *Bearings*
Jubilee of Basic Steel Process in France, 171. See 488, 674
— of Canadian Nickel Industry, 413
Jung, Messrs. Ball Bearings for Machine Tools, 325*. See *Erratum*, 388
Junior Institution of Engineers, Presidential Address, by Sir A. Gibb, on Future of Water Power in Great Britain, 24; Jubilee Celebrations, 299; Annual Dinner, 523
Junkers-Motorenbau G.m.b.H., 425-b.h.p., Six-Cylinder Aeroplane Engine, 527

K.

KAMERLINGH-ONNES, Researches on Low Temperatures, 135, 165
Kandó System of Electric Traction, Hungarian State Railways, 58*, 296*, 349*
Kärger, G., Fine-Turning Lathe, 293*
Karlsruhe Institute, Investigations on Hydraulic Turbines (Review), 669
Kellaway, Rt. Hon. F. G., the Late, 435
Kelvin Lecture on Travel of Wireless Waves, 494
Kemp, G. S., the Late, 72
Kennedy, J. M., on Costs of Electricity Supply and Distribution, 253. See LETTER, 364
Kennelly-Heaviside Layer, Effect on Travel of Wireless Waves, 494
Kent, G., Ltd., Air-Operated Controllers and Recorders, 209*; Variable-Speed Gears for Integrating and Counting Mechanisms, 686
Kestner Evaporator & Engineering Co., Ltd., Climbing Film Evaporator, 397*
Keyham College for Naval Engineers, History of, 562, 657
Kiers, Steel, for Alumina Production, 593*
Kiln, Cement, Wet-Process, Waste-Heat Boiler for, 616*
Kinematograph Film Illustrating Cable Manufacture, 100
King, C. R., on Trevithick's London Exhibition Railway, 693*
King, J. H., on Machinery for Cargo Ships, 112
Kingston By-Pass Road, Treatment with Coias, 659
Kinlochleven Works, British Aluminium Co., Ltd., Electrode Production, 592, 628, 634*
Kinsky, F., on Columnar Crystals in Steel Sheets, 542
Kiosk, Pole-Mounted Switch (Ferguson, Pailin, Ltd.), 234*
Kipp, P. J., & Sons, Pressure Balance for High Pressures, 172*
Kirby, C. C., on Main Road Lighting, 11
Kirchels, E., Bakelite Moulding Press, 481*; Pattern-Punching Attachment for Presses, 481*
Kitchen & Wade, Ltd., 7-ft. Radial Drilling Machine, 141*; Multiple-Spindle Reaming Machine, 478*
Klopsch, O. Z., on Arsenical-Copper Tubing, 665
Klüssendorf, H. H., Precision Boring Machine, 401*
Knock Ratings of Motor Fuels, 465
Kola Peninsula, Russia, Apatite Deposits, 430
Kommers, Prof. J. B., on Failure by Fatigue, 238. See LETTERS, 299, 459
Koppers Coke Oven Co., Ltd., Coke-Oven Plant at Beckton, 617
Krause, E., & Co., A.-G., Combination Tool, 294*
Krishnaraja Reservoir, Sivasamudram Hydro-Electric Scheme, 1*

L.

"L'ATLANTIQUE," S.S., Fire on, 49
La Bour Co., Inc., Self-Priming Electrically-Driven Centrifugal Pump, 194*
La Mont Water-Walls for Marine Boilers, 12*
Laboratories, Cambridge University Engineering Department, 117*
— See also *National Physical*

Labour:

Employment in Engineering and Allied Industries, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
Hours of Labour and After-Hours Employment, 48
Industrial Accidents. See *Accidents*
Labour Notes, 10, 40, 82, 98, 127, 157, 198, 228, 260, 276, 313, 339, 366, 392, 405, 431, 458, 500, 514, 553, 579, 603, 631, 646, 673, 712. See PARAGRAPH INDEX
— Office, International, Report on Safety in Manufacture and Use of Celluloid, 654
Mass Production and Unemployment, 17. See 282
Proposed Forty-Hour Working Week, 681
Unemployment in Engineering and Allied Industries, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
— and Mass Production, 17. See 282
— in United States, 103, 221. See LETTER, 170

Labour—*continued.*

Wages, Effect on Unemployment, 104. See LETTER, 170
Workmen's Compensation Acts and Breach of Statutory Regulations, 682
Ladder, Steel, for Motor Turntable Fire Escape, 666*
Lagging Materials. See *Heat Insulation*
Laidlaw, Drew & Co., Ltd., Oil-Fuel Burners, 186
Lake Titicaca, Bolivia, Motor Boat for, 15
Lakeman *versus* Chester Corporation, Compensation for Change of Electric System, 283
Lamps, Electric. See *Electric*
— Miners', Illumination from, 619
Lancashire Boiler. See *Boiler*
Lancashire Steel Corporation, Ltd., Irlam Coke-Oven and Recovery Plant, 539*
Land Drainage (Review), 64
Lander, Dr. C. H., Heat-Transfer Measuring Apparatus, 568
Lange und Geilen, Hydraulically-Operated Shaping Machine, 400*
Langerbrugge Power Station, Benson Boiler, 11
Langham Pumping Station, South Essex Waterworks Co., 711
Lanterns, Electric, for Road Lighting, 12
Larke, E. C., on Hardness Testing of Thin Copper Strips, 367*. See 364
Latham *versus* Johnson, 626
Lathes. See *Machine Tools*
Launch, Motor. See *Motor Boat*
Launches and Trial Trips, 44, 218, 410, 434, 544, 622, 704
Laurence, Scott & Electromotors, Ltd., Direct-Current Steel-Frame Mill Motor, 249*; Three-Phase Phase Advancer, 249
Law. See *Legal; Labour; Patents*
Laycock Engineering Co., Car Washer, 306*
Lay, Prof. W. E., on Air-Resistance of Motor-Cars, 521
Lea, Prof. F. C., on Relationship of Engineering to Metallurgy, 447
Lead Alloys. See *Alloys* under *Metallurgy*
— Effects of Addition of Tellurium to, 310, 317*
— Pipes, Action of Drinking Water on, 386
— Prices. See *Metal-Price Diagrams*
— Tetraethyl, Effect on Petrol-Engine Valves, 56*
Lead Wool Co., Ltd., Portable Petrol-Driven Air Compressor, 367*
Leavitt Machine Co., Valve-Seating Machine, 138*

Legal:

Absalom *versus* Great Western Garden Villages Society, Ltd., 547
Canada Grain Act, 142
Children and Dangerous Machinery, 626
Coal Mines Act, Effect on Shipping Industry, 223
Infringement Action Threats, 365
Labour Legislation. See *Labour*
Lakeman *versus* Chester Corporation, Compensation for Change of Electric System, 283
Liabilities of Gas Manufacturers, 282. See 390*. See LETTER, 380
London Passenger Transport Act, Appointment of Board, 575
Patent Law. See *Patents*
Road and Rail Traffic Bill, 438
Rudd *versus* Elder Dempster & Co., Ltd., 682
Workmen's Compensation. See *Labour*
See also PARAGRAPH INDEX
Legislation. See *Legal; Labour; Patents*
Legros, L. A., the Late, 684*
Leipzig Fair, Machine Tools at, 293*, 323*, 400*, 451*, 481*. See *Erratum*, 388
Leitz Metallographic Microscope, 79; Universal Dilatometer, 482*
Lessing, Dr. R., on Chemical Engineering, 165
Letters to the Editor, 11, 52*, 81, 107, 129, 170, 186*, 216, 250, 275, 299*, 338*, 364, 383, 416, 459, 578, 658, 687, 713
Lewis-Dale, H. A., on Construction of Aerodromes, 329
Libani Davits, S.S. "Conte di Savoia," 606*
Libraries, Indexing of Technical Papers in, 119
Lift Maintenance Manual, 60
Light Alloys. See *Alloys* under *Metallurgy*
— Scattering of, 193
Lighting, Aerodrome, Standardisation of, 105
— Gas. See *Gas*
— of Main Roads, 11
— in Mines by Miners' Lamps, 619
— Street, by Hot-Cathode Lamps, 369*
— System, Paris Metropolitan Railway, 320, 371
— Underground Railways Stations, Improvements in, 675
— Watford By-Pass Road, 679
Lillicrap, C. S., on Electric Welding in Warship Construction, 419*. See 442
Lime, Excess, Purification of River Water by, 692, 711
— Tanks for Wire Cleaning, Working of, 609
Lincoln Electric Co., Shielded-Arc Welding Process, 688*
Lindblad, Prof. A. F., Ship Model Tests on Local Hollowing Forward, 469
Lindner, H. G.m.b.H., Drilling Machine with Circular Slide, 402*
Liner Concrete Machinery Co., Revolving-Pan Concrete Mixer, 445*
Liners. See *Steamers*
Liquid Fuel. See *Oil Fuel*
— Level Controller (H. Belfield Co.), 138*
Literature, 4, 63, 108, 123, 289, 295, 372, 403, 537, 601, 613, 642, 669. See LITERATURE INDEX
Lithuania, Telsiai-Kretinga Railway, 495
Livermore, J. E., the Late, 218
Liverpool Docks Extensions, 498*
— Garston Gas Works, 618
— Gas Company, History and Work of, 617
Livesey & Henderson, 1,700 h.p. Oil-Electric Mobile Power Houses and Locomotive, 328*
Lloyd's Statistics, Vessels under Construction, 79, 413
— — Vessels Launched, 234
Load-Discharging Floor for Lorries (Transport Engineering, Ltd.), 247
— Factor, Russian Power Stations, 476
— — Thornhill Power Station, 659
Local Government Officers, National Association, Report on Municipal Finance in America, 105
Loch Ericht Development, Grampian Hydro-Electric Scheme, 607
Lochaber Works, North British Aluminium Co., Ltd., Aluminium Production at, 592, 628, 634*
Locks, Severn Barrage Scheme, 307, 395, 599
Lockouts. See *Labour*
Locomotive, Condensing, 2-8-2 Type, Argentine State Railways, 517*
— Construction, Russian Programme of, 288
— Diesel, Combined Water and Oil Cooler, 287*
— — Electric, Advantages and Disadvantages of, 79, 85*. See *Erratum*, 107
— 1,700 h.p. Diesel-Electric, Buenos Aires Great Southern Railway, 328
— Diesel-Engined, Operating Results with, 265
— — Engined, Reliability and Economy of, 454
— Electric, on Austrian Federal Railways, 233
— — 2,500-h.p., Hungarian State Railways, 58*, 296*, 349*
— — 1,600-h.p., Swedish State Railways, 449
— Industry, Position and Prospects, 309
— Mechanical Breakdowns of, 496, 583
— Murdock, Presentation to Birmingham, 495
— Oil-Electric, for British Railways, 79, 85*. See *Erratum*, 107
— 16-h.p. Oil-Engined (Ruston & Hornsby, Ltd.), 248
— 300-h.p. Petrol, Bermuda Railway Co., 676*
— 4-6-2 Type, Paris and Orleans Railway, 31*
— Road. See *Motor; Road; Tractor*
— "Royal Scot," London, Midland & Scottish Railway, 558
— Shunting, 65-85 h.h.p. Diesel-Engined (Motor Rail, Ltd.), 213*
— — Oil-Engined, for London Midland & Scottish Railway, 467
— Steam and Oil, Operating Costs of, 79, 85*, 454. See *Erratum*, 107
— Three-Cylinder, French State Railways, 34*
— Trevithick's Invention of, 441, 459, 693*
— See also *Railways* in PARAGRAPH INDEX
Loewe Gesfürel, Grinding Machine, 324*
London Area, Telephone Progress in 1932, 180
— Chamber of Commerce, Taxation of Advertisement Matter, 627
— County Council and Battersea Power Station Extension, 361; Reconditioning of Waterloo Bridge, 165
London General Omnibus Co., Oxy-Acetylene Welding Installation, 353*
— Midland & Scottish Railway, 250-h.p. Diesel-Electric Express Rail Coach, 255. See 281, 330. See LETTERS, 299, 338; Oil-Engined Shunting Locomotives for, 467; "Royal Scot" Train at Chicago World's Fair, 558; Developments on, 573
— National Safety Congress, 506, 574
— & North Eastern Railway, Developments on, 573
— Passenger Transport Board, Appointment, 575
— Piccadilly Traffic Control System, 596. See 388*
London Power Company, Battersea Power Station, 89*, 152, 361, 585*, 667*
— Smoke Nuisance in the 17th Century, 626
— Trafalgar Square, Electro-Matic System o Traffic Control in, 388*. See 596
— Underground Railways. See *Underground*
— University College, Faculty of Engineering, Courses in, 250
— — New Headquarters, Bloomsbury, 709
— World Petroleum Congress, Programme, 197, 391, 540
Lorient, Marine Turntable Slipway, 650-ton, 550*, 629*
Low-Loading Trailer Co., Double-Horse Road Box, 700*
— Temperature Carbonisation of Coal. See *Coal*
Low-Temperature Carbonisation, Ltd., Contract for Oil from Coal for Navy, 193; Petrol from Coal for Aircraft, 361
— — Researches, 104, 135, 165, 193
Lubricating Oils. See *Oils*
Lubrication of Electric Motors, 191
— Theory of, 217, 275
Luffing Gear, 150-ton Floating Crane, 178*
Luton-Watford Power Transmission Towers, Earth Resistance of, 145*. See *Addendum*, 250
Lydall, F., on Railway Electrification in India, 133
Lyons, C., Ltd., Exhibits at Physical Society's Exhibition, 169
Lysaght, W. R., on Iron and Steel Sheet Industry, 524

M.

MACAULAY, F. W., the Late, 594
Mac. See also *Mc*
Machine Shops. See *Works* and *Machine Tools*
— Testing. See *Testing Machines* and *Tests (Materials)*

Machine Tools:

Bending Machine, Pipe, Belt-Driven (Major, Robinson & Co., Ltd.), 550*
— and Tempering Machine, Leaf-Spring (Collet & Engelhard A.-G.), 481*
Boring-Machine Gear for Motor-Lorry Differential Housings (G. Richards & Co., Ltd.), 344*
— — Horizontal (Schiess-Defries A.-G.), 402*
— — Portable, for Motor Cylinders (Buma Engineering Co.), 229*
— — Precision (Hahn und Kolb), 400*

Machine Tools—*continued.*

Boring-Machine Precision (H. H. Klüssendorf), 401*
— — Spindle and Faceplate (Deutsche-Niles-Werke A.-G.), 402*
— — Vertical (Schiess-Defries A.-G.), 294*
— Mill, with Electro-Hydraulic Thrustors (British Thomson-Houston Co., Ltd.), 249*
— and Surfacing Machine, Horizontal (G. Richards & Co., Ltd.), 60*
Burnishing and Brushing Machine for Tubes (F. Gilman (B.S.T.), Ltd.), 210*
Combination Tool (E. Krause und Co. A.-G.), 294*
Drill Chuck (Brooke Tool Manufacturing Co., Ltd.), 212*
— Hammer, Mechanical (W. Geipel, Ltd.), 204
Drilling Machine with Circular Slide (H. Lindner G.m.b.H.), 402*
— — 7-ft. Radial (Kitchen & Wade, Ltd.), 141*
— and Sawing Machine, Rail (G. Wagner), 453*
Drop-Stamps, Accelerator for (B. & S. Massey, Ltd.), 146*. See LETTER, 187
Grinding Head for Lathe (W. Hegenscheidt), 295*
— Machine, Crankshaft (F. Schmaltz G.m.b.H.), 323*
— — for Circular Saws (S. Russell & Sons, Ltd.), 209*
— — Cylinder-Block (Mayer & Schmidt A.-G.), 325*
— — Precision (Loewe Gesfürel), 324*
— — Surface (Billeter und Klunz A.-G.), 324*
— — Surface (F. Schmaltz G.m.b.H.), 325*. See *Erratum*, 388
— — with Swivelling Column (Billeter und Klunz A.-G.), 323*
— — Tool, Double-Headed (Schiess-Defries A.-G.), 325*
— — Treadle-Driven (F. Gilman (B.S.T.), Ltd.), 210*
— — Twist-Drill (A. A. Jones & Shipman, Ltd.), 266*
— and Polishing Machine for Glazed Surfaces (F. Gilman (B.S.T.), Ltd.), 210*
— Set, Flexible-Shaft (C. L. Jarvis Co.), 71*
Hacksawing Machine (E. G. Herbert, Ltd.), 342*
Hobbing Machine, Gear (J. E. Reinecker A.-G.), 451*
Honing Machine, Internal-Spline (Sunbeam Motor Car Co., Ltd.), 714*
— — Portable, for Motor Cylinders (Buma Engineering Co.), 229*
Hydraulic Press. See *Press* (below)
Lathe, Automatic, Six-Spindle Vertical (Tavannes Watch Co.), 619*
— 26-in. Centre, Square-Ingot Turning (Craven Brothers (Manchester), Ltd.), 108*
— 28-in. Combination Turret (H. W. Ward & Co., Ltd.), 551*
— Fine-Turning (G. Kärger), 293*
— Hexagon Turret, for Bar Work (H. W. Ward & Co., Ltd.), 551*
— High-Speed (H. A. Waldrich G.m.b.H.), 294*
— 1·8-metre Heavy, Electrically-Operated (Maschinenfabrik Froriep G.m.b.H.), 39*
— Seven-Tool Automatic (Automatenwerk Steinhauser), 294*
— Wheel, Universal (W. Hegenscheidt), 294*
Lapping Machine, Gear (F. Werner A.-G.), 452*
— — Universal (Hahn und Kolb), 325*
Machine Shop Management. See *Works Management*
— Tools, Ball Bearings for, 325*
— — Application of Hydraulic Drive to, 293, 400
— — Construction, Russian Programme, 288
— — Design, German, Tendencies in, 293
— — Import Duties, 187
— — Industry, Position and Prospects, 268
— — at Leipzig Fair, 293*, 323*, 400*, 451*, 481*. See *Erratum*, 388
— — Trades Association, Annual Dinner, 385, 387. See LETTER, 416
Milling Machine, Electrically-Driven (F. Werner A.-G.), 403*
— — High-Duty (Wanderer-Werke A.-G.), 451*
— — Slot (A. H. Schütte), 451*
— — Slotting and Face (Automatenwerk Steinhäuser), 451*
Pipe-Bending Machine, Belt-Driven (Major, Robinson & Co., Ltd.), 550*
Polishing Machine with Dust Extractor (W. Canning & Co., Ltd.), 270*
— and Grinding Machine for Glazed Surfaces (F. Gilman (B.S.T.), Ltd.), 210*
Presses, Automatic Feed Gear for (Maschinenfabrik Weingarten), 481*
— Balanced, Crank-Operated (Taylor & Challen, Ltd.), 241*
— Bar-Straightening, Pedal-Operated (C. Hurth), 453*
— Bending and Punching, Wide-Gap, (Taylor & Challen, Ltd.), 277*
— Bushing, Pedal-Operated (C. Hurth), 453*
— Hydraulic, for Carbon Electrode Production, 634*
— 400-ton (Maschinenfabrik Weingarten), 482*
— Moulding, Bakelite (E. Kirchels), 481*
— Pattern Punching Attachment for (E. Kirchels), 481*
— Power, Guards for (J. Broughton), 270*
— — Operated, for Injection Moulding (T. H. & J. Daniels, Ltd.), 240*

Machine Tools—*continued.*

Presses, Power, Simplex Drawing Device for (J. Rhodes & Sons, Ltd.), 241
— for Tablet Making (T. H. & J. Daniels, Ltd.), 240*
— Turntable-Feed, Crank-Operated (Taylor & Challen, Ltd.), 241*
Reaming Machine, Multiple-Spindle (Kitchen & Wade, Ltd.), 478*
Sanding Machine, Floor-Surfacing (Porter-Cable-Hutchinson Corporation), 30*
Saw, Band, for Metals (Gebr. Thiel G.m.b.H.), 453*
— Circular, Motor-Driven, for Farm Use (Allgemeine Elektricitats Gesellschaft), 671*
— See also *Hacksawing Machine* (above).
Sawing and Drilling Machine, Rail (G. Wagner), 453*
— Machine (E. G. Herbert, Ltd.), 342*
— — Cold, with Hydraulic Feed (S. Russell & Sons, Ltd.), 209*
— — Cold (Gebr. Heller), 453*
Shaping Machine, 18-in. Stroke Crank-Operated (Butler Machine Tool Co., Ltd.), 154*
— — Hydraulically-Operated (Lange und Geilen), 400*
— — Hydraulically-Operated (Wotan-Zimmermann-Werke), 400*
Shearing Machine, Guillotine (Brookes (Oldbury), Ltd.), 240*
Slotting Machine, Tool Room (Butler Machine Tool Co., Ltd.), 303*
Surfacing and Boring Machine, Horizontal (G. Richards & Co., Ltd.), 60*
Tapping Head, Self-Contained (C. L. Jarvis Co.), 71*
Tempering and Bending Machine, Leaf-Spring (Collet und Engelhard A.-G.), 481*
Tube Brushing and Burnishing Machine (F. Gilman (B.S.T.), Ltd.), 210*
Turning and Boring Mills. See *Boring* (above)
Turret Lathes. See *Lathes* (above).
Valve-Seating Machine (Leavitt Machine Co.), 138*
Vice, Bench, Noveto (E. L. Youngleson, Ltd.), 527*
— Core Box (Newman, Hender & Co., Ltd.), 487*
Wire-Drawing Machine, Immersed-Die (Sir J. F. Norton & Co., Ltd.), 208*
Woodworking Machinery, Floor-Surfacing Sander (Porter-Cable-Hutchinson Corporation), 30*
— Motor-Driven Circular Saw (Allgemeine Elektricitäts Gesellschaft), 671*
— Processes, Investigations of, 637
— Researches at Forest Products Laboratory, 27*
See also PARAGRAPH INDEX
Machine Work. See *Machine Tools*
Machinery Breakdowns, Investigations of, 488*, 496*, 554*, 582, 661*. See *Erratum*, 596
— Construction, Russian Programme of, 288
— Dangerous, and Children, 626
— Imports and Exports, Statistics, 20, 92, 150, 181, 224, 268, 308, 361, 413, 443
— Noises, Acoustics Laboratory for Researches on, 563*
Madras, Metur Dam, 55*; Industrial Developments, 658
Magnesium Alloys. See *Alloys* under *Metallurgy*
— Influence of Volatile Chlorides on, 363, 675
Magnetic Compasses at Ashmolean Museum, Oxford, 535
— Research, Royal Society Mond Laboratory for, 165
Magnetism and Electricity, Theory of (Review), 107
Mahr, C., G.m.b.H., Dial Gauges, 482*; Screw Thread Gauge, 482*
Mains, Electric. See *Cables* under *Electric*
— Gas, Coke-Oven and Recovery Plant, Irlam, 540*
— — Electrolytic Corrosion in, 617
— Water, Types of, 691
Major, Robinson & Co., Ltd., Pipe-Bending Machine, 550*
Malcolm, G. W., the Late, 287
Mallock, R. R. M., Electrical Calculating Machine, 567*
Management and Industrial Engineering (Review), 106
— of Works. See *Works Management*
Manchester Association of Engineers, Electric Motor Development, by D. B. Hoseason, 191
Manchester Furnaces, Ltd., Oil-Fired Heat-Treatment Furnace, 242*
— Municipal College of Technology Scholarships, 462; Evening Courses in Technology, 596
— Tootal, Broadhurst, Lee & Co.'s Showroom, Heating and Ventilating System, 434
— University, Tidal Model of Severn Estuary, Investigations with, 599. See 307, 394*
Mandi Hydro-Electric Scheme, Opening of, 308
Mangin, Davson & Partners, Ltd., Temperature Measurement and Control Chart, 67*. See *Addendum*, 275
Manufacture, Scientific Methods in. See *Works Management*
— See also *Trade*
Manufactured Products, Quality Control of (Review), 63
Manufacturers, Government's Attitude to, 685
Manville, Sir E., the Late, 365
March, S. H., the Late, 545
Marconi's Wireless Telegraph Co., Ltd., Cape Town Broadcasting Station Equipment, 46; Exhibits at Physical Society's Exhibition, 166*; Transmitters for West Regional Broadcasting Station, 543*
"Mari," S.S., Boiler Explosion, 233
Marine Auxiliary Machinery, S.S. "Conte di Savoia," 424,* 606*
— Boilers. See *Boilers*

Marine Engineering History, Chapters in, 321, 561, 657
— — Industry, Position and Prospects, 413
— — Lloyd's Statistics, 79, 413
— — and Power Plant Practice, 111
— Engineers, Institute of, Annual Dinner, 223; Grant of Charter to, 430
— Engines. See *Engines; Turbines; Marine Propulsion*
— Machinery, Output, 1932, 22, 44, 69
— Organisms, Destruction of Timber by, 104, 187, 217
— Propulsion, Application of Power Plant Practice to Ships, 111
— — Control of Electrical Machinery for, 236
— — Diesel-Electric Plant for 150-ton Floating Crane, 177*
— — 6,000-h.p. Eight-Cylinder Oil Engine, M.S. "Oceania," 644*
— — Electric Transmission, History of, 321
— — 100,000-h.p. Geared Turbines, S.S. "Conte di Savoia," 423*
— — Geared Turbines, History of, 321
— — 12,000-s.h.p. Geared Turbines, S.S. "Santa Rosa," 112
— — Hydraulic Transmission, History of, 321
— — Introduction of Steam Turbines, 321
— — Machinery for Cargo Steamers, 393, 415
— — 10,000-s.h.p. Oil Engines, H.M. Submarine "Thames," 258*
— — Oil Fuel for. See *Oil Fuel*
— — Pulverised Fuel Firing in S.S. "Nagoya Maru" and "Johore Maru," 377*
— — 360-b.h.p. Six-Cylinder Oil Engine, Motor Tug "Crowstone," 158*
— — Turbo-Electric System, Twenty-Fifth Anniversary, 520
— — Water-Tube Boilers for Cargo Ships, 333
— — 160,000-h.p. Zoelly Turbines, S.S. "Normandie," ATV Steel Blading, 289
— — See also *Engines; Turbines; Propellers; Ship Resistance*; and PARAGRAPH INDEX
— Structures, Deterioration of, Report, 708
— Towers for Grain Handling, 144,* 200*
— Turbines. See *Turbines, Steam; Marine Propulsion*
— Turntable Slipway, 650-ton, Lorient, 559*, 629*
"Mariposa," S.S., Performance of, 113
Maritime Conference, Baltic and International, Rationalisation of Shipping Tonnage, 438
Markets. See *Trade* and PARAGRAPH INDEX
Markham & Co., Ltd., 24,000-h.p. Double-Runner Hydraulic Turbines, 511*
Marking Foundry Patterns, Specification, 140
"Marlborough," H.M.S., Training School for Naval Engineers, 562
Marryat & Scott, Ltd., Lift Maintenance Manual, 60
Marshall, D. F., on External Heat Loss of Blast Furnaces, 526; on Coke Consumption in Blast Furnaces, 531. See 525*
Marshall, Sons & Co., Ltd., Development of Traction Engines by, 640*; Oil-Driven Roadless Tractor, 700*
Marshalling Sidings, Southampton Dock Extensions, 613*
Maschinenfabrik Froriep G.m.b.H., 1·8-metre Electrically-Operated Heavy Lathe, 39*
Maschinenfabrik Weingarten, Automatic Feed Gear for Presses, 481*; 400-ton Press, 482*
Maschinenfabrik B. R. Wolf A.-G., 1·44 cub. yd. Overburden Bucket Dredger-Excavator, 406*
Masnedsund Highway and Railway Bridge, Denmark, 497*
Masons Portland Cement Co., Ltd., Waste-Heat Boiler for Cement Kiln, 616*
Mass Production and Unemployment, 17, 681. See 282
Massachusetts Institute of Technology, High-Tension Research Apparatus, 688*
Massey, B. & S., Ltd., Accelerator for Drop Stamps, 146*. See LETTER, 187
Masters, P. E., on Aperture Ratio for Standard Sieves, 65*
Materials, Mechanics of (Review), 239
— Strength of (Review), 373
— — of. See also *Stress* and *Tests* (*Materials*)
Mathematical Instruments at Ashmolean Museum, Oxford, 534*
Matthews, R. B., on German National Agricultural Show, 670*
Matthieu, E., on Electric Furnaces for Basic Steel Process, 172.
Maxwell Scholarship in Electrical Engineering, 356
May Lecture, Institute of Metals, on Quenching and Tempering of Alloys, 549
Mayer & Schmidt, A.-G., Cylinder-Block Grinding Machine, 325*
M. & C. Switchgear, Ltd., Push-Button Contactor-Starter, 215*; 400-ampere Oil-Circuit Breaker, 215*
McAlister, W. J., on Position of Shipping Industry, 222
McAlpine, Sir R., & Sons, Ltd., Dunston Power Station, 155*; Southampton Dock Extensions, 611*
McComb, S. D., on Structural Hazards on Shipboard, 111
McLaren, J. & H., Ltd., 20–25-b.h.p. Four-Cylinder Marine Oil Engine, 700*
McLennan, Prof. J. C., on Low-Temperature Research, 104, 135, 165, 193
McWhirter, W., the Late, 302
Mechanical Engineering and Power Exhibition, New York, 37*, 70*, 138, * 194*
— Engineers, American Society of, Mechanism of Lubrication, by W. F. Parish and L. Cammen, 217, 275; Researches on Saturated Steam, by N. Osborne, H. F. Stimson, E. F. Fiock and D. C. Gimmings, 707

Mechanical Engineers, Institution of:

Summer Meeting, Canada:
Reunion and Dinner, 19
London Meetings, Winter Session:
Compression-Ignition Engine and Its Applicability to British Railway Traction, by Lieut.-Col. L. F. R. Fell, 85*. See 79. See *Erratum*, 107

Mechanical Engineers: Institution of— *continued.*

Presentation of Prizes, 224
Annual Report, 224
Election of Officers, 136, 224
Handling and Storing of Grain, with Special Reference to Canadian Methods, by H. H. Broughton, 141*, 199*. See 136, 568*
Production of Vacuum in Air Tank by Means of a Steam Jet, by F. R. B. Watson, 230*, 262*. See 255*
Welding Research Committee, Programme of Work, 277
Benevolent Fund Meeting, 335
Radium in Engineering Practice, by Dr. V. E. Pullin, 340*. See 335
Examination Regulations, Revision of, 360
Investigation of Mechanical Breakdowns of Prime Movers and Boiler Plant, by L. W. Schuster, 488*, 554*, 661*. See 496, 582, 596
Summer Meeting, Edinburgh:
Inaugural Proceedings, 627
Aluminium Industry in Scotland, by G. Boex, 592*, 633*. See 628
Visits and Excursions, 655
Institution Dinner, 656
North-Western Branch:
Training the Engineer for Management, by E. T. Elbourne, 75
Investigation of Mechanical Breakdowns of Prime Movers and Boiler Plant, by L. W. Schuster, Discussion on, 582. See *Erratum*, 596. See 488*, 496, 554*, 661*

"Mechanical Horse" (Scammell Lorries, Ltd.), 633*
— Stoker. See *Stoker*
Mechanics, Applied, International Congress for, Cambridge, 1934, 709
— of Materials (Review), 239
Megger Earth Tester (Evershed & Vignoles, Ltd.), 77*
Meikle, J., on Toughened Plate Glass, 527
Melchett Medal, Award to Sir J. Cadman, 679
Melms-Pfenniger Steam Turbine, Use in Warships, 322
Memorial to C. Frémont, in Paris, 542
— to Pioneers, 658. See 625. See LETTERS, 687, 713
— Trevithick, at Merthyr Tydfil, Proposed, 463 See 106, 439*, 459, 467
Merchant Shipbuilding. See *Shipbuilding*
— Ships. See *Ships; Steamers*
Mercury Prices. See *Metal-Price Diagrams*
Merrick Scale Manufacturing Co., Continuous Weigher for Belt Conveyors, 70*
Merryweather & Sons, Ltd., Motor Turntable Fire Escape, 666*
Mersey Docks and Harbour Board, Liverpool and Birkenhead Dock Extensions, 498*
Merz & McLellan, Dunston Power Station, 155*
Mesnager, A., the Late, 216
Metals, Anti-Friction. See *Alloys* under *Metallurgy*
— Corrosion of. See *Corrosion*
— Fatigue of. See *Alternating Stress* under *Tests* (*Materials*)
— Filament Lamps. See *Lamps* under *Electric*

Metals, Institute of:

Spring Meeting, London:
May Lecture on Phenomena of Quenching and Tempering in Alloys, by Prof. A. Portevin, 549
Programme, 197
Report of Council, 284
Honorary Treasurer's Report, 284
Election of Officers, 284
Reports of Discussions, 310, 326, 362
Annual Dinner, 312
Effects of Addition of Tellurium to Lead, by W. Singleton and B. Jones, 317*. See 310
Interpretation of Tensile Test (with Reference to Lead Alloys), by Professor B. P. Haigh and B. Jones, 314*. See 311
Effects of Variations in Mould and Pouring Temperatures on the Macro- and Microstructures of Some Low Melting-Point Metals and Alloys, by F. D. Weaver, 311
Physical Properties of Zinc at Various Stages of Cold-Rolling, by R. Chadwick, 326
Fatigue-Resisting Properties of Light Aluminium Alloys at Elevated Temperatures, by J. W. Cuthbertson, 342*. See 327
Electrical Conductivity of Aluminium Wire, by A. J. Field and J. H. Dickin, 473*. See 327
Graphitic Silicon, Heat Treatment and Electrical Conductivity of Aluminium, by Dr. L. H. Callender, 327
X-Ray Investigation of Copper-Aluminium Alloys, by Dr. A. J. Bradley and Dr. P. Jones, 327
Distribution of Porosity in Copper Ingots, by N. P. Allen, 362
Equilibrium of Reaction between Steam and Molten Copper, by N. P. Allen and T. Hewitt, 363
Effects of Hydrogen and Oxygen on the Unsoundness of Copper-Nickel Alloys, by N. P. Allen and Dr. A. C. Street, 363
Influence of Volatile Chlorides on Magnesium and on Copper, by J. D. Grogan and T. H. Schofield, 675. See 363
Application of Diamond-Pyramid Indentation Test to Copper and Copper-Rich Alloys in Form of Thin Strip, by Dr. M. Cook and E. C. Larke, 367*. See 364
Metals, Low Melting-Point, Effect of Mould Temperatures on, 311
— Non-Ferrous, Converters for Production of, 171
Metals Price Diagrams, 24*, 170*, 288* (see *Erratum*, 304), 422*, 506*, 632*
— in Service of Human Life and Industry, 575
— Structure of. See *Metallography; Microphotographs*
— Welding. See *Welding*
— See *Metallurgy; Microphotographs*
Metallography. See *Metallurgy; Microphotographs*
Metallurgical Exhibits at Royal Society Conversazione, 566
— Investigation of Mechanical Breakdowns, 488*, 496, 554*, 582, 661*

Metallurgy:

Alloys, Aluminium, Fatigue-Resisting Properties of, 327, 342*
— — Heat Treatment and Annealing of (Review), 614
— Copper-Aluminium, Röntgen-Ray Investigation of, 327
— — Nickel, Effect of Hydrogen and Oxygen on, 363
— — See also *Brass; Bronze; Gunmetal, &c.*
— Lead, Interpretation of Tensile Tests, 311, 314*
— Low-Melting Point, Effect of Mould Temperatures on, 311
— Quenching and Tempering Phenomena in, 549
— Titanium-Magnesium, Attempt to Prepare, 675
Aluminium and its Alloys, Heat Treatment and Annealing (Review), 614
Blast Furnaces. See *Furnaces*
Brass. See *Brass*
Bronze. See *Bronze*
Cast Iron. See *Cast Iron*
Coke Ovens. See *Coke Ovens*
Copper, Molten, and Steam, Reaction between, 363
Corrosion of Metals. See *Corrosion*
Foundry. See *Foundry; Moulding*
Furnaces, Electric. See *Furnaces*
Heat-Treated Steel Sheets, Formation of Columnar Crystals in, 542
— Treatment of Aluminium Wire, 327, 473*
— — and Annealing of Aluminium (Review), 614
— — Electric Furnaces for, 284*. See LETTERS, 338
— — of Hypo-Eutectoid Steels, 541
— — Quenching and Tempering Phenomena, 549
— — Stainless Steels, Effect on Intergranular Corrosion, 689*
— — of Steels, Application of Thermo-Magnetic Cycle to, 67*. See *Addendum*, 275
— — of Steel for Internal-Combustion Engine Valves, 57
Iron Manufacture. See *Furnaces, Blast*
Metals in Service of Human Life and Industry, 575
— Tests of. See *Tests* (*Materials*)
Metallurgical Exhibits at Royal Society Conversazione, 566
— Investigation of Mechanical Breakdowns, 488*, 496, 554*, 582, 661*
Metallurgy, Relationship of Engineering to, 447
Pulverised Coal, Use in Metallurgy. See *Pulverised Coal*
Pyrometers. See *Pyrometers*
Radiographic Testing of Metals, 335, 340*
Refractories. See *Refractory Materials; Firebricks*
Rolling Mills. See *Rolling Mills*
Steel, ATV Non-Corroding, for Turbine Blading, 289*
— Austenitic Properties of, 615
— Basic Process, Jubilee of Introduction into France, 171. See 488, 674
— Chromador High-Tensile (Dorman, Long & Co., Ltd.), 275
— Furnaces. See *Furnaces*
— Hypo-Eutectoid, Changes on Heating, 541
— Inclusions in, Investigation of, 528*, 589. See *Erratum*, 552
— Process, Bessemer, Discovery of, 171
— Rapid Dephosphorisation and Deoxidation of, 488, 674. See 171
— Stainless, Intergranular Corrosion of, 615, 689*
Welding. See *Welding*
Zinc Coatings on Wire, Tests of, 175
See also *Iron and Steel Institute; Metals, Institute of; Microphotographs; Foundry*; and PARAGRAPH INDEX
Metcalf, J. S., Co., Ltd., Canadian Granary Construction, 141*, 199*
Meteorological Society, Royal, Symons Memorial Lecture, on Cosmic Radiation, by P. M. S. Blackett, 391; Intrusion of Air into Anticyclones, by C. S. Durst, 637; Estimation of Solar Radiation in Relation to Warming Effect on Human Body, by Dr. H. M. Vernon, 637; Rainfall over British Isles in Eleven Decades, 1820–1929, by Dr. J. Glasspoole, 637; Adiabatic Lapse-Rate for Dry and Saturated Air, by D. Brunt, 652; Variations in Structure of Wind over Different Surfaces, by C. S. Durst, 652; Variations of Wind Direction in British Isles since 1341, by Dr. C. E. P. Brooks and T. M. Hunt, 652
Meter, Flow, Mechanical (Brown Instrument Co.), 530*
— Frequency (Everett, Edgcumbe & Co., Ltd.), 77*
— Hydrogen-Ion (Cambridge Instrument Co., Ltd.), 50*
— Moisture (Cambridge Instrument Co., Ltd.), 49*
— Power Factor (Elliott Brothers (London), Ltd.), 51*
Metropolitan-Vickers Electrical Co., Ltd., Developments in Circuit-Breaker Design, 8*, 48. See LETTERS, 216, 259, 275, 364, 578; Electrical Equipment, Hungarian State Railways, 58*, 206*, 349*; 80,000-kVA Turbo-Generator, Battersea Power Station, 91*; 66-kV Switchgear, 152*; Deceleration Governor for Winding Engines, 114*; Electrical Plant Construction in 1932, 203; 24,000-kW Super-Pressure Turbine, 283. See *Erratum*, 330; Arrest and Trial of Staff in Russia, 385, 467. See LETTER, 416; Acoustics Laboratory, 563*; Small-Case Switchboard Instrument, 571; 67,200-kW Turbo-Alternator, Battersea Power Station, 585*, 667*; Bubbling Valve, 602; Electrical Equipment, Grimsby Fish Dock Ice-Making Plant, 647*
Metropolitan. See also *London*
Metur Dam, Madras, 55*; Industrial Developments, 658
Michelin Tyre Co., Pneumatically-Tyred Railway Carriages, 653
Michell, A. G. M., on Invention of Michell Bearing, 323
— Thrust Bearing, 67,200-kW Steam Turbine, 586*
Michels, Dr. A., Pressure Balance for High Pressures, 172*
Michigan University, Tank Experiments on Local Hollowing Forward, 469; Researches on Air-Resistance of Motor Cars, 521
Micrometer, Scalcometer (W. Ottway & Co., Ltd.), 78
Microphone, Moving-Coil (Standard Telephones and Cables, Ltd.), 168
Microphotographs, Concrete Samples, 686
— Defective Internal-Combustion Engine Exhaust Valves, 83*, 580*
— Fractured Boiler Plate, 664*
— — Connecting Rod Bolts, 662*
— — Steel Crankshaft, 556*
— Heat-Treated Austenitic Stainless Steels, 690*
— Inclusions in Steels, 528*, 589
— Tellurium-Lead, 310, 317*
Microscopes, Early, at Ashmolean Museum, Oxford, 534*
— Metallographic (E. Leitz (London)), 79
— for Opaque Minerals (R. & J. Beck, Ltd.), 78
— Tool-Room (W. Ottway & Co., Ltd.), 78
Microscopy, Industrial (Review), 373
Microtome, Automatic, 566
Midland Coke Research Committee, Investigation of the Effect of Breeze on Coke Consumption in Blast Furnaces, 525, 531*; Investigation of External Heat Loss of Blast Furnace, 526
Midland Great Western Co. of Ireland *versus* Cooke, 626
Midwest Piping & Supply Co., Inc., Welded Pipe Fittings, 70
Mills, Rolling. See *Rolling Mills*
— Water, Shetland, 292
Millenicut Files (T. Firth & J. Brown, Ltd.), 214
Millery Power Station, ATV Steel Turbine Blading at, 290
Milling Machines and Cutters. See *Machine Tools*
Milne, C. S., & Co., Ltd., Oxy-Acetylene Plant, 353*
Mineral Industry of World, Position of, 664
— Oils. See *Oils*
— Resources of Alberta, Exploration of, 146
— Transport, Railway Wagons for, 495
— See also *Coal; Mining*; and PARAGRAPH INDEX
Miners' Lamps, Illumination from, 619
Mines, Ignition of Fire Damp by Explosives, Report, 110
— Lighting at Coal Face, 619
— Shafts, Vertical, Dangers of Safety Catches for, 426*
— United States Bureau of. See *United States*
— Use of Liquid-Oxygen Explosives in, 18
— Winding. See *Winding*
— See also *Coal; Collieries; Mining; Winding*; and PARAGRAPH INDEX
Mining Engineers, Institution of, Presidential Address, by J. Brass, on Coal Mining Industry, 164
— and Metallurgical Engineers, American Institute of, Presidential Address, by S. Turner, on Present Status of the Mineral Industry, 664; Competitive Relation of Coal and Petroleum in United States, by Prof. W. S. Hutchinson and A. J. Breitenstein, 664; World's Oil Supplies, by V. R. Garfias, 664; Improved Nickel-Chromium Hardened Chilled Cast Iron, by J. S. Vanick, 665; Fabrication and Properties of Seamless Phosphorised Arsenical Copper Tubing, by G. L. Craig and O. Z. Klopsch, 665; Ore Dressing and Coal Preparation, by E. A. Holbrook, 665; Yieldable Metal Props for Underground Support, by R. D. Parks, 665
— and Metallurgy, Canadian Institute of, Annual Banquet, 413
— — Institution of, Annual Dinner, 495
— Modern Practice in Colliery Machinery (Review), 403
— See also PARAGRAPH INDEX
"Minor" Bench Plating Barrel, 270*
Mirrlees, Bickerton & Day, Ltd., 360-b.h.p. Six-Cylinder Marine Oil Engine, 158*
"Miss England III," Motor Boat, Porpoising of, 485
Missiessi Power Station, Toulon Arsenal, Use of ATV Steel Turbine Blading, 289
Mitchell Conveyor & Transport Co., Ltd., Coal and Ash-Handling Plant, New Blackburn Meadows Power Station, 456*
Mitchell, W. B., on Cost of Materials in Firebrick Manufacture, 610
Mixer, Sand, Continuous-Operation (Fordath Engineering Co., Ltd.), 487*
— Water (Fulton-Sylphon Co.), 138*
Mixing Machines, Concrete. See *Concrete*
Model Experiments on Surge Tanks, 116
— — See also *Aeronautics; Ship Resistance*
— Ferro-Concrete Slabs, Cracking in, 686
— Railway Club Exhibition, 470
— Ship-Shaped, Flow of Water Past, 469
— Tidal, of Severn Estuary, Report on, 599. See 307, 394*
Moir, Sir E. W., Bart., the Late, 683*

Moisture Meter (Cambridge Instrument Co., Ltd.), 49*
Moments of Inertia, New Rules for, 508*
Monkey Wire Strainer (Trewhella Brothers Proprietary, Ltd.), 700*
Monkswell, Lord, on French Locomotive Performances, 31*
Monoliths, Ferro-Concrete, Southampton Dock Extensions, 612*
"Monterey," S.S., Performances of, 113
Montreal, Grain-Handling and Storing at, 144, 200, 568*
— Harbour, 12,000-lb. Automatic Grain-Weighing Machine, 568*. See 136, 141*, 199*
Morgan Crucible Co., Ltd., Oil-Fired Crucible Furnace, 183*
Morgan, E., New Blackburn Meadows Power Station, 378*, 456*, 701*
Morison, D. B., Writings on Naval Engineer Question, 657
Mortar and Pestle, Electrically-Driven (Baird & Tatlock (London), Ltd.), 96
Moscow Thermo-Technical Institute, 24,000-kW Super-Pressure Turbine, 283. See *Erratum*, 330
Motor Boats, High-Speed, Porpoising of, 485
— — for Lake Titicaca, Bolivia, 15
— Body Building, Private and Commercial (Review), 123
— Cars, Air-Resistance of, Researches on, 521

Motor-Car Details:

Differential Gear, Failure through Sharp Corners, 451*
Engines. See *Engines, Petrol, Motor-Car*
Tyres and Rims, International Conference on Standardisation, 709

Motor-Car Engineers. See *Automobile Engineers*
— — Engines. See *Engines, Petrol*
— — Fuels. See *Motor Fuels*
— — Road Tests of Motor Fuels, 465
— — Speed Record, 282
— — Washer (Laycock Engineering Co.), 396*
— — Washer, Two-Hose (B.E.N. Patents, Ltd.), 328*
— — See also *Motor Cycle*; and PARAGRAPH INDEX
— Coach, 120-h.p. Oil-Engined, Tests of, 204*
— Carriages, Railway. See *Carriages*
— Cycle Industry, Position and Prospects, 150
— Electric, for Bucket Dredger-Excavator, 406*
— — for Canadian Granaries, 144
— — for Civil Engineering Work, 632
— — for 150-ton Floating Crane, 177*
— — Fractional Horse-Power (Higgs Motors), 418*. See 710*
— — for Farms, Improvements in, 671*
— — for 80,000-ton Granary, Bahia Blanca, 147*, 205*, 268*
— — Induction, Protective Relay for (Nalder, Brothers & Thompson, Ltd.), 95*
— — 2,500-h.p. Locomotive, Hungarian State Railways, 59, 296*, 349*
— — Manufacture of (Higgs Motors), 710*. See 418*
— — Mill, Direct-Current Steel-Frame (Laurence, Scott & Electromotors, Ltd.), 249*
— — Progress in Design, 191
— — for Railway Rolling Stock, 226
— — for Ship Propulsion, Control of, 236
— — 175-h.p. Traction, Paris Metropolitan Railway, 428*
— — for Valve Operation (Drayton Regulator & Instrument Co., Ltd.), 51*
— Fuels, Experiments on Ease of Starting with, 300*, 374*. See *Errata*, 430
— — Knock Ratings of, 465
— — Road Tests, 465
— Generator, 12,000-volt Direct-Current, for Rugby Radio Station, 55*
— Industry, Position and Prospects, 150, 181
— Internal-Combustion. See *Aeronautics; Engines; Motor Cars; Motor Boats; Tractors*
— Launches. See *Motor Boats*
— Lorries, Load-Discharging Floor for (Transport Engineering, Ltd.), 247
— Marine. See *Engines; Marine Propulsion; Motorships*
— Omnibus, Gas-Driven, 211
— Paraffin. See *Engines, Oil*
— Petrol. See *Aeronautics; Engines, Petrol; Motor Boats; Motor Cars; Tractors*
Motor Rail, Ltd., 65-85 b.h.p. Diesel Shunting Locomotive, 213*
— Road Rollers. See *Road Rollers*
— Spirit. See *Motor Fuel*
— Tractors. See *Tractors*
— Tug "Crowstone," General Wharfage & Supply Co., 158*
— Vehicles, Imports and Exports, 181
Motorships, Cargo, Machinery for, 112
— Constructed in 1932, 24, 45, 101
— under Construction, Lloyd's Statistics, 79, 413
— Launched, Lloyd's Statistics, 234
— "Oceania," 6,000-h.p. Eight-Cylinder Oil Engine, 644*
— Repairing and Reconditioning of, 134
Motosacoche, S. A., 7-h.p. Two-Stroke Oil Engine, 312*. See *Addendum*, 331
Mould, Paper-Making Cylinder (T. H. & J. Daniels, Ltd.), 240*
Moulding Machine for Flat Castings (Foundry Equipment, Ltd.), 549*
— — Injection (T. H. & J. Daniels, Ltd.), 240*
— — Roll-Over (Foundry Equipment, Ltd.), 549*
— See also *Foundry*
M. O. Valve Co., Ltd., 500-kW Cooled-Anode Valve, 167*
Mowlem, J., & Co., Ltd., Battersea Power Station, 89*, 152*. See 585*, 667*
Muirhead & Co., Ltd., Exhibits at Physical Society's Exhibition, 168
Muller, G., Ball Bearings for Machine Tools, 326*
Multitubular Boilers. See *Boilers*
Municipal Finance in United States, Report, 105
— Tramways. See *Tramways*
Murchison Earthquake, New Zealand, Effect on Engineering Structures, 478
Murdock Locomotive, Presentation to Birmingham, 495
Murex Welding Processes, Ltd., Polyarc Welding Transformer, 275*
Murray River Works, Australia, Report on, 361
Museum, Ashmolean, Oxford, Scientific Instruments at, 533*
— Dominion, Wellington, New Zealand, Design of, 478
Mysore, Sivasamudram Hydro-Electric Scheme, 1*

N.

NACHSHEN, M., on Foundations and Tunnels at Ford Motor Works, Dagenham, 169
"Nagoya Maru," S.S., Pulverised-Fuel Trials, 377*
Nalder, Brothers & Thompson, Ltd., Protective Relay for Induction Motors, 95*
Napier Earthquake, New Zealand, Effect on Engineering Structures, 478
National Benzole Association, Researches on Benzole Refining, 422
— Electrical Manufacturers' Association, United States, Unemployment Insurance Scheme, 222
National Gas and Oil Engine Co., Ltd., 630-b.h.p. Six-Cylinder Oil Engine, 41*; 72-b.h.p. Four-Cylinder Oil Engine, 124*. See *Addendum*, 288
— Physical Laboratory, Aeronautical Researches at, 76; Aerodynamics Department, Compressed-Air Wind Tunnel, 309; New Radio Department, 548; Exhibits at Royal Society Conversazione, 602
— Safety Congress, London, 506, 574
— Smoke Abatement Society, Views on Domestic Smoke, 387; Reprint of Evelyn's *Fumifugium*, 626
Natural Asphalte Mine-Owners and Manufacturers' Council, Specification for Mastic Asphalte, 79
Naval Architects, Education of, 114

Naval Architects, Institution of;

Scholarships in Naval Architecture, 14

Spring Meeting, London:
Programme, 355
Report of Council, 414
Induction of New President, Lord Stonehaven, 414
Election of Officers, 414
Presidential Address, by Lord Stonehaven, on Shipping and Shipbuilding Industries, 414
Reports of Discussions, 415, 441, 467, 483
Annual Dinner, 415
Improved Forms of Modern Cargo Steamers and Effect on their Operating Costs Due to their Low Fuel Consumption, by J. T. Batey and J. L. Batey, 393*. See 415
Tonnage Measurement, by N. G. Nilsson, 415, 441
Use of Electric Arc Welding in Warship Construction, by C. S. Lillicrap, 419*. See 442
Constructional Tests on Mild-Steel Rolled Sections with Electrically-Welded Joints, by Prof. B. P. Haigh, 442
Stress Distributions in Fusion Joints of Plates Connected at Right Angles, by Prof. E. G. Coker and R. Russell, 442
Effect of Wind on Ship Performance, by Dr. G. Hughes, 467
Screw-Propeller Experiments with Models of Coasters, by Dr. F. H. Todd, 468
Effect of Local Hollowing Forward with Varying Type of Sections and Length of Entrance, by Prof. A. F. Lindblad, 469
Photographic Study of Mechanism of a Ship's Wake, by Prof. T. B. Abell, 469
Preliminary Calculations of Sizes of Gyroscopes Required to Stabilise a Ship, by Dr. P. Schilovsky, 470. See 345*, 507*. See LETTERS, 53, 107, 578. See *Erratum*, 596
Naval Water-Tube Boilers, Experiments and Shop Trials, by Engineer-Captain S. R. Dight, R.N., 483
Problem of Water-Cooled Piston Rod in Two-Stroke Cycle Double-Acting Oil Engines, by Dr. S. F. Dorey, 484
Problem of Structural Design of Pressure Hull of Submarines, by R. L. Payne, 484
Suggested Method of Minimising Vibrations in Ships, by Prof. C. E. Inglis, 445*. See 485
Porpoising of High-Speed Motor Boats, by W. G. A. Perring, 485

Naval Architects and Marine Engineers, American Society of, Welding Longitudinal Seams of Shell Plating, by L. C. Bibber, 111; Stability of Ships after Damage, by J. C. Niedermair, 111; Structural Hazards on Shipboard, by S. D. McComb, 111; Modern Power Plant Practice and its Application to Marine Work, by R. C. Roe, 111; Propulsion Turbines and Gears for Panama Mail Steamships, by A. R. Smith, 112; Machinery for Modern Cargo Ships, by J. H. King, 112; Performance of the "Mariposa" and "Monterey," by J. E. Burkhardt, 113; Performance of Standard Oil Tankers, by R. L. Hague, 113; Raising the S.S. "Segovia," by H. F. Norton, 113; Education of Naval Constructors and Naval Architects, by Rear-Admiral G. H. Rock, 114
— Architecture and Marine Engineering, Royal School of, History of, 562
— Constructors, Royal Corps of, Jubilee Dinner, 193
Naval Engineering History, 321, 561, 657
— Engineers, Training and Status of, 561, 657
— and Shipping Annual, Brassey's (Review), 601
— See also *Warships*
Navigation, Compasses at Ashmolean Museum, Oxford, 535
— Echo-Sounding Gear (H. Hughes & Son, Ltd.), 96
— Harrison's First Marine Timekeeper, 306
Navy, British. See *H.M.* under *Warships*
— Estimates, 1933-34, 437
— United States. See *United States* under *Warships*
— See also *Naval; Warships;* and PARAGRAPH INDEX
Negretti & Zambra, Humidity Controller, 166*; Temperature Recorder, 166*
Neill, J., & Co. (Sheffield), Ltd., Adjustable Hacksaw Frames, 556*
Nene River Catchment Board, Steam Dredging Crane, 501*
Neunkirchen Gasholder, Explosion of, 282, 390*. See LETTER, 389
Neutralisation Vessel for Glucose Manufacture, 238
Neutron and Proton, Relationship, 377
Nevson Tangraph Rule, 448
New Blackburn Meadows Power Station, Sheffield, 378*, 456*, 701
— South Wales Public Works Department, Annual Report, 438
— — Wales, Sydney Harbour Bridge, Souvenir of, 430
— Year's Honours List, 18
— York, Albany, Self-Supporting Arc-Welded Steel Roof, 22*
— — Power and Mechanical Engineering Exhibition, 37*, 70*, 138*, 194*
— Zealand Earthquakes, Effect on Engineering Structures, 478
— — Wellington, Design of Dominion Museum, 478
Newcomen Society, A Cornish Engineer, Arthur Woolf, 1766-1837, by R. Jenkins, 109; Vauxhall and the Marquis of Worcester, by W. H. Thorpe, 292; Shetland Water Mill, by H. W. Dickinson and E. Straker, 292; Evolution of Early American Bridges, by Captain L. N. Edwards, 389; Summer Meeting, Falmouth, 571, 713
Newman, Hender & Co., Ltd., Core-Box Vice, 487*
"Niagara" Motor-Car Washer, 396*
Nicholson, W. S., on Southend Waterworks, 692
Nickel Industry, Canadian, Jubilee of, 413
Niedermair, J. C., on Stability of Damaged Ships, 111
Nilsson, N. G., on Tonnage Measurement, 415, 441
Nitrate Deposits in United States, Report, 21
Nitrogen Production in United States, 21
— Properties at Low Temperatures, 193
Niva, River, Russia, Hydro-Electric Plant, 430
Noakes, D. M., on Costs of Electricity Supply and Distribution, 253. See LETTER, 364
Noeggerath High-Pressure Electrolysers, 399
Noises, Machinery, Acoustics Laboratory for Researches on, 563*
Non-Conducting Coverings. See *Heat Insulation*
— Ferrous Metals. See *Metals*; *Metallurgy*
Nord Railway, Locomotive Performances on, 31
Norfolk, T. L., Liverpool and Birkenhead Docks Extensions, 498*
"Normandie," S.S., ATV Steel Turbine Blading in, 289
Norrie, C. M., on River Hooghly Tunnel, 41
North Acton, Electrically-Welded Factory at, 444
North British Aluminium Co., Ltd., Lochaber Works, Aluminium Production at, 592, 628, 634*
North British Rubber Co., Ltd., Explosion of Steam-Heated Vulcaniser, 621
North-East Coast Institution of Engineers and Shipbuilders, Modern Ship Repairing, by J. Patton, 134; Radiation in Boiler Furnaces, by W. T. Bottomley, 333; Water-Tube Boilers for Cargo Ships, by Engr. Rear-Admiral W. M. Whayman and Major W. Gregson, 333. See *Erratum*, 382. See LETTER, 389.
North Eastern Electric Supply Co., Ltd., Dunston Power Station, 155*
— Notes from, 14, 44, 73, 101, 131, 160, 189, 219, 251, 278, 305, 331, 357, 382, 409, 435, 463, 491, 519, 545, 570, 597, 623, 651, 678, 679, 704. See PARAGRAPH INDEX
— Staffordshire Institute of Mining Engineers, Lighting at the Coal Face, by S. Barber, C. C. Emmett and T. D. Jones, 619
— — Technical College, Tests of Refractories at, 5*
— West, Notes from, 15, 45, 72, 101, 130, 160, 189, 218, 250, 278, 305, 331, 356, 383, 409, 463, 491, 519, 545, 571, 596, 623, 650, 679, 704. See PARAGRAPH INDEX
Northumberland Yard Seam Coal, Carbonisation of, 717
Norton, H. F., on Raising S.S. "Segovia," 113
Norton, Sir J. F., & Co., Ltd. Immersed-Die Wire-Drawing Machine, 208*
Notched-Bar Tests. See *Tests (Materials)*
Notes on New Books. See *Books* and LITERATURE INDEX
— See *Cleveland; North; North-West; South West; South Yorkshire; Labour.* See also PARAGRAPH INDEX
Nottingham, Whitworth Society Summer Meeting, 709
Noveto Bench Vice, 527*
Nozzles, Standard, for Air-Flow Measurement, 686
— Steam, for Air Ejector Experiments, 230*, 255*, 262*
Nuttall, E., Sons & Co., and J. Mowlem & Co. (Joint), Ltd., Southampton, Graving Dock, 696*
Nyasaland, Economic Conditions in, Report, 584

O.

Obituary:

Alexander, Prof. T., 287
Askwith, R., 365
Asquith, J. G., 570
Asquith, J. W. S., 417
Blunt, W. W., 330
Boyd, W. R. E., 418
Briggs, J., 197
Campbell, J., 24
Clarkson, T., 417
Collins, A. E., 108
Congleton, Lord, 11
Denholm-Young, J., 137
du Pasquier, A. E., 578
Fleuss, H. A., 196
Henshaw, A. M., 108
Jackson, Major C. M., 170
Kellaway, Rt. Hon. F. G., 435
Kemp, G. S., 72
Legros, L. A., 684*
Livermore, J. E., 218
Macaulay, F. W., 594
Malcolm, G. W., 287
Manville, Sir E., 365
March, S. H., 545
McWhirter, W., 302
Mesnager, A., 216
Moir, Sir E. W., Bart., 683*
Orsettich, R., 444
Parry, J., 444
Peake, A., 570
Pulman, T. C., 108
Reid, Sir. J., 137
Riseley, H. J., 259
Roberts, F., 11
Roberts, H. W., 218
Robinson, A. E., 331
Royce, Sir F. H., 470*
Sames, C. M., 389
Shave, G. J., 136
Sherley-Price, H., 54
Simpson, W., 71
Skinner, F. W., 54
Thornton, Sir H., 332
Trevithick, R. L., 197
Unwin, Dr. W. C., 336*
Vaughan, W. H., 11
Walker, S., 197
Ward, J. C., 216
Warren, Lieut.-Col. P. R., 365
Wester Wemyss, Lord, 593
Weyman, J. E., 623
Wilson, E. A., 513
Wormald, Sir J., 578
"Oceania," M.S., 6,000-h.p. Eight-Cylinder Oil Engine, 644*
Oertling, L., Ltd., Chemical Balances, 78
Ofverholm, L., on Railway Electrification in Sweden, 133, 449*
Ohio Steel Works, Blast Furnace, 501*
Oil from Coal for Navy, 193
— and Coal in United States, Competition between, 664
— Engines. See *Engines, Oil; Motor Cars; Motor Boats; Tractors*
— Films and Lubrication, 217, 275
— Fuel Burner, Automatic (Parker, Winder & Achurch, Ltd.), 185*
— — Burner, Electromatic (G. C. Pillinger & Co., Ltd.), 186
— — Burner, Rotamiser (Combustions, Ltd.), 186
— — Burners, for Stoves (Laidlaw, Drew & Co., Ltd.), 186
— — Burners (Wallsend Slipway & Engineering Co., Ltd.), 212*
— — *versus* Coal, Pamphlet on, 601
— — Taxation of, 523, 575, 683
— Heavy, Proposed Tax on, 523, 575, 683
— Industries Exhibition, International, 391
— Motors. See *Engines, Oil; Motor Cars; Motor Boats; Tractors*
— Production and Reserves, Statistics, 664
— Purifiers, Centrifugal (Sharples Speciality Co.), 195
— Sealing Ring, Spring-Fitted (Super Oil Seal Manufacturing Co. (England), Ltd.), 30*
— Separators, Grimsby Fish-Dock Ice-Making Plant, 648*
— Switches. See *Switchgear*
— Tankers, Performances of, 113
— Tractors. See *Tractors*
Oil Well Engineering Co., Ltd., Diesel-Driven Slush Pump, 594*
— See also *Lubrication; Petroleum*
Olympia. See *Exhibition*
Omnibus, Motor. See *Motor Omnibus*
Onnes, Kamerlingh, Researches on Low Temperatures, 135, 165
Open-Hearth Furnace. See *Furnace*
— Mesh Bridge Decking (Irving Iron Works Co.), 636*
Optical Apparatus, Physical Society's Exhibition, 49*, 77*, 94*, 166*
— Instruments at Ashmolean Museum, Oxford, 533*
Optics, Industrial Microscopy (Review), 373
Ore Dressing and Coal Preparation, Comparisons, 665
— Handling Plant for American Blast Furnaces, 503*
Orsettich, R., the Late, 444
Osborne, N., on Properties of Saturated Steam, 707
Oscillograph. See *Electric*
O'Shaughnessy, F. R., on Sewage Disposal, 163
Ottway, W., & Co., Ltd., Tool-Room Microscope, 78
Ovens, Baking, for Carbon Electrode Production, 634
— Coke. See *Coke Ovens*
Overhead Cranes. See *Cranes*
— Lines, Power Transmission, Conductivity of Aluminium Wire for, 327, 473*
— — Power Transmission, Earth Resistance of Towers, 145*. See *Addendum*, 250
— — Power Transmission, Progress of National Scheme, 411
— — Power Transmission, Upper Egypt, 60

Overseas Marketing Service, Ltd., Exhibition Ship Scheme, 334
— Markets, Co-operative Selling in, 135
— Trade Department, Report on Economic Conditions in Italy, 174, 192; in Chile and Ecuador, 466; in East Africa, Northern Rhodesia and Nyasaland, 584; in Southern Rhodesia, 584; in Brazil, 600; in Philippine Islands, 637; in Portuguese East Africa, 674
Owens, Dr. J. S., on Atmospheric Pollution, 493
Oxford, Ashmolean Museum, Early Scientific Instruments at, 533*
— Merton College, Course for Teachers in Technical Schools, 218
Oxy-Acetylene Welding. See *Welding*
Oxygen Compounds as Inclusions in Steels, 528*, 589
— Effect on Copper-Nickel Alloys, 363
— Installation, Chiswick Works, London General Omnibus Co., 353*
— Liquid, for Explosives, 18

P.

P. AND H. Tree-Stump Puller, 475*
Palestine. See *Anglo-Palestine Exhibition*
Panama Mail Steamship Co., Machinery of S.S. "Santa Rosa," 112
Pantographs, Current-Collecting, Electric Locomotive, Hungarian State Railways, 296*
— for Electric Rail Coaches, Copenhagen Railways, 477*
Paper-Making Cylinder Mould (T. H. & J. Daniels, Ltd.), 240*
Paraffin Engines. See *Engines, Oil*
— Tractors. See *Tractors*
Paris, International High-Tension Conference, 99
— Memorial to C. Frémont, 542
— Metropolitan Railway, Developments, 61*, 122*, 319*, 371,* 428*
— Orleans Railway, 4-6-2 Type Locomotive, 31*
Parish, W. F., on Lubrication, 217, 275
Parker, Winder & Achurch, Ltd., Automatic Oil-Fuel Burner, 185*
Parks, R. D., on Yieldable Metal Props, 665
Parry J., the Late, 444
Parsons, C., His Life and Work (Review), 601
Parsons, C. A., & Co., Ltd., 50,000-kW Turbo-Generators, 156*; Electrical Plant Construction in 1932, 203
Parsons Marine Steam Turbine Co., Introduction of Geared Turbines, 322
Parsons Oil Engine Co., Ltd., 150-h.p. Eight-Cylinder Petrol Engine, 676*
Particles, Swift, Detection and Production of, 283, 309, 377
Parwinac Oil Burner, 185*
Passenger Steamers. See *Steamers*
— Traffic, Paris Metropolitan Railway, 429*
— Transport Board, London, Appointment, 575
Pasteuriser, Electrically-Operated, 671*
Patents and Designs Act, 1932, 365
— — Acts (Review), 537
— Record, 450*, 718*. See PATENT RECORD INDEX
Paterson Engineering Co., Ltd., Filtration Plant, Langham Waterworks, Essex, 711
Patterns, Foundry, Marking and Colouring, Specification, 140
Patton, J., on Ship Repairing, 134
Paving, Cast-Iron (Stanton Ironworks Co., Ltd.), 174
Payne, R. L., on Design of Submarine Hulls, 484
Peake, A., the Late, 570
Pearce, Dr. S. L., Battersea Power Station, 89*, 152*, 585*, 667*
Pelly, R. G., on Excess Lime Water Purification Process, 692, 711*
Pendred, L. St. L., on Trevithick, 467
Pennsylvania, Aliquippa Steel Works, 1,000-ton Blast Furnace at, 501*
Permutit Co., Automatic Water Softener, 195*
Perrin, R., Researches on Dephosphorisation and Deoxidation of Steel, 488, 674. See 171; on Inclusions in Steels, 528*. See 589. See *Erratum*, 552
Perring, W. G. A., on Porpoising of Motor Boats, 485
Persia, Oil Production in, 664
Personal, 14, 44, 72, 100, 130, 160, 188, 218, 250, 278, 304, 330, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704
— Success, Views on, 11
Pervibrateurs, Concrete, Paris Metropolitan Railway, 371*
Petrol and Benzole-Petrol Mixtures, Ease of Starting with, 300*, 374*. See *Errata*, 430
— Carburettors. See *Carburettors*
— Driven Trailer Fire Pump, 699*
— Motors. See *Aeronautics; Engines, Petrol; Motor Cars; Motor Boats; Tractors*
— Production from Coal, 164, 361
— Tractors. See *Tractors*
Petroleum Congress, World, London, Programme, 197, 391, 540
— Technologists, Institution of, Mechanism of Lubrication, 317, 275
— Technology, Scientific Principles of (Review), 669
— See also *Oil; Paraffin; Engines, Oil*
Petter 4-h.p. Twin-Cylinder Petrol Engine, 700*
Pfeil, Dr. L. B., on Properties of Austenitic Steels, 615
Phase Converter, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*
Philippine Islands, Trade Conditions in, Report, 637
Phosphor Bronze Strip, Hardness Tests of, 367
Phosphorus, Effect on Corrosion of Iron, 590
— Influence on Hardened Cast Iron, 590
Photo-Elastic Determination of Stresses in Welded Joints, 442
— Electric Cells, Exhibition at Science Museum, 387
Photogrammetry, Collected Lectures on (Review), 643
Photography, Wave-Speed Camera for Explosion Research, 110
Photomicrographs. See *Microphotographs*
Physical Apparatus, Physical Society's Exhibition, 49*, 77*, 94*, 166*, 261*
— — Royal Society Conversazione, 566*, 591*, 602*
— Chemistry. See *Chemistry*
— Laboratory. See *National Physical*
— Society, Exhibition of Apparatus, 49*, 77*, 94*, 166*, 261*; Award of Duddell Medal to W. Gaede, 164, 650
Physics, Atomic, Advances in (Review), 295
— Cosmic Radiation, Investigation of, 391
— Electrons and Waves (Review), 123
— Equation of State of Real Fluid, 439
— Ionosphere, Investigation of, 602
— Low-Temperature Researches, 104, 135, 165, 193
— — Temperature Research, Royal Society Mond Laboratory for, 165
— Radium in Engineering Practice, 335, 340*
— Sounding Plates and Sensitive Flames, 523
— Spectrophotometry, Notched Echelon Cells for (A. Hilger, Ltd.), 96*
— Swift Particles, Detection and Production of, 283, 309, 377
— Text-Book of (Review), 4
— Transmutation of Elements, 348
— Travel of Wireless Waves, 494
— Universe of Science (Review), 106
Piccadilly, London, Traffic Control System, 596. See 388*
Piérard, P., on Bessemer Converters for Basic Steel Process, 171
Pig Iron Prices. See *Metal-Price Diagrams*
Piles, Wharf, Sydney, Destruction by Marine Organisms, 104
Piling, Ferro-Concrete, Ford Motor Works, Dagenham, 169
Pillinger, G. C., & Co., Ltd., Electro-Matic Oil-Fuel Burner, 186
Pinions. See *Gears; Gearing; Marine Propulsion*
Pioneers, Memorials to, 658. See 625. See LETTERS, 687, 713
Pipe-Bending Machine. See *Machine Tools*
— Fittings, Welded (Bonney Forge and Tool Works), 70
— — Welded (Midwest Piping and Supply Co., Inc.), 70
— Flanges, Specification, 698
— Lead, Action of Drinking Water on, 386
— Lines, Chemical, Identification Plates, Specification, 101
— — Gas, Belgium, 618
— — Lochaber Hydro-Electric Scheme, 628, 635
— — Steel, Sivasamudram Hydro-Electric Scheme, 1*
— — Welded Steel, Loch Ericht Hydro-Electric Scheme, 608
— Steam. See *Steam Pipes*
— Systems, Handbook of (Review), 404
— Tellurium-Lead, Effects of Frost on, 310, 318
— Welded, Tummel Bridge Hydro-Electric Plant, 513*
— See also *Tubes*
Piræus Electricity Co., Floodlighting of Acropolis, 357
Pitting. See *Corrosion*
Place de la Bastille Station, Paris Metropolitan Railway, 319*
Place de la République Station, Paris Metropolitan Railway, 319*
Planimeter and Pole Wagon (W. F. Stanley & Co., Ltd.), 419*
Planing Machine. See *Machine Tools*
Plastics Industry Exhibition, Science Museum, 523
Plates, Boiler, Failure through Chemical Embrittlement, 583, 663*. See *Erratum*, 596
— Shearing Machine. See *Machine Tools*
— Steel, Electric Welding of, 419*, 442
— — Prices. See *Metal-Price Diagrams*
Plating, Electro. See *Electro*
Platinum Resistance Pyrometers. See *Pyrometers*
Plough, Motor. See *Tractor*
Ploughing, Application of Steam to, 642*
Pneumatic Tools. See *Machine Tools*
— See also *Compressed Air; Air Compressor*
Pole Changer, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*, 350*
— Fista, for Overhead Power-Transmission Lines, 273*
— Mounted Switch Kiosk, 234*
— Telegraph and Telephone, Steel, Specification, 605
— Wagon and Planimeter (W. F. Stanley & Co., Ltd.), 419*
Pollution, Atmospheric, Research Committee, Annual Report, 493
— of River Tees, Investigation of, 386
Polyarc Welding Transformer, 275*
Polytechnic, London, Lectures on Illumination, 74
— See also *Education*
Pont Brûlé, Vilvorde, Coke-Oven Plant, 618
Porosity in Copper Ingots, 362
Porpoising of High-Speed Motor Boats, 485
Portable Engine. See *Engine*
— Machine Tools. See *Machine Tools*
Porte d'Italie Rectifier Substation, Paris Metropolitan Railway, 321*
Porter-Cable-Hutchinson Corporation, Floor-Surfacing Sander, 30*
Portevin, Prof. A., on Basic Steel Process, 171. See 488, 674; on Quenching and Tempering of Alloys, 549; on Inclusions in Steels, 528*. See 589. See *Erratum*, 552
Portland Cement. See *Cement*
Portuguese East Africa, Economic Conditions in, Report, 674
— Navy, Sloops for, 108, 704
— — Torpedo-Boat Destroyers for, 652
Post Office, Rugby Radio Station, 12,000-volt Motor-Generator, 25*
Pot, Explosion, Design for Circuit Breakers, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
Pot Galvanometer (Cambridge Instrument Co., Ltd.), 49
Powdered Coal. See *Pulverised Coal*
Power Houses, Mobile, Oil-Electric, Buenos Aires Great Southern Railway, 328*
— and Mechanical Engineering Exhibition, New York, 37*, 70*, 138*, 194*
— Plants, Hydro-Electric, Alluvial-Matter Eliminators for, 480
— — Hydro-Electric, British Aluminium Co., Ltd., 628, 634
— — Hydro-Electric, Canadian, Statistics, 526
— — Hydro-Electric, Diablo, Washington, 300-ton Overhead Travelling Crane, 416*
— — Hydro-Electric, in Great Britain, 24
— — Hydro-Electric, in Italy, 174
— — Hydro-Electric, Loch Ericht Scheme, 607
— — Hydro-Electric, Lochaber, 634
— — Hydro-Electric, River Niva Scheme, Russia, 430
— — Hydro-Electric, Russian, 430, 475
— — Hydro-Electric, Severn Barrage Scheme, 307, 394*, 599
— — Hydro-Electric, Sivasamudram, Mysore, 1*
— — Hydro-Electric, Tummel Bridge, 24,000-h.p. Turbines, 511*
— — Hydro-Electric, Uhl River Scheme, Opening of, 308
— — Management (Review), 404
— — See also *Power Stations; Power, Water; Substations*
— Press. See *Machine Tools*
— for Ship Propulsion. See *Marine Propulsion; Ship Resistance*
— Stations, Electric, Austrian Federal Railways, 232
— — Electric, Bánhida, Hungarian State Railways, 58*
— — Electric, Battersea, 89*, 152*; 67,200-kW Turbo Alternators, 585*, 667*; Emission of Fumes, 361
— — Electric, Bermuda, 2,500-b.h.p. Six-Cylinder Fullagar-Diesel Engine, Trials of, 604*
— — Electric, Dagenham, Foundations and Circulating-Water Tunnels, 169
— — Electric, Dunston, 155*
— — Electric, Fulham, 658
— — Electric, in Italy, 174
— — Electric, Langerbrugge, Benson Boiler, 11
— — Electric, Moscow, 24,000-kW Super-Pressure Turbine, 283. See *Erratum*, 330
— — Electric, New Blackburn Meadows, Sheffield, 378*, 456*, 701
— — Electric, Russian, 475
— — Electric, South Africa, 665
— — Electric, Southampton, Circulating Water Culverts, 613*
— — Electric, Thornhill, Operating Results, 659
— — Electric, Tuscany, 522
— — Electric, Use of ATV Steel Turbine Blading in, 289*
— — Electric, Valenciennes, Feed-Water Distillation System, 116*
— — Electric, West Regional Broadcasting Station, 542*
— — See also *Power Plants; Substations*
— Supply, Electric, for Austrian Federal Railways, 232
— — Electric, Canada, Statistics, 526
— — Electric, Compensation for Change of System, 283
— — Electric, Great Britain, 334; Distribution Costs of, 253. See LETTER, 364
— — Electric, for Industrial Heating, 284*. See LETTERS, 338*
— — Electric, in Italy, 174
— — Electric, Paris Metropolitan Railway, 320*
— — Electric, Progress in Russia, 475
— — Electric, Report of Central Electricity Board, 411
— — Electric, Severn Barrage Scheme, Report, 307, 394*, 599
— — Electric, Sivasamudram, Mysore, 1*
— — Electric, in South Africa, Progress of, 665
— — Electric, Tuscany, 522
— — Electric, Value of Research in, 223
— Transmission, Magnetic Clutch for (T. Broadbent & Sons, Ltd.), 660*
— — Overhead Lines, Conductivity of Aluminium Wire for, 327, 473*
— — Overhead Lines, Earth Resistance of Towers, 145*. See *Addendum*, 250
— — Overhead Lines, Loch Ericht Hydro-Electric Scheme, 608
— — Overhead Lines, Progress of National Scheme, 411
— — Overhead Lines, Upper Egypt, 60
— — See also *Gearing; Marine Propulsion*
— Water, in Great Britain, Future of, 24
— — in Canada, Statistics, 526
— — Severn Barrage Scheme, Model Tests, 599. See 307, 394*
— — See also *Hydraulic; Power Plants, Hydro-Electric; Turbines, Hydraulic*
Precipitation Plant, Sludge (W. Boby, Ltd.), 243*. See *Erratum*, 305
Precipitators, Electric, for Blast-Furnace Gas, 502, 541
Presidential Address to American Institute of Mining and Metallurgical Engineers, by S. Turner, on the Mineral Industry, 664
— — to Chamber of Shipping, by W. J. McAlister, on Shipping Industry, 222
— — to Federation of British Industries, by Sir G. Beharrel, 412
— — to Institution of Gas Engineers, by R. E. Gibson, on Gas Industry, 617
— — to Institution of Mining Engineers, by J. Brass, on Coal Mining Industry, 164
— — to Institution of Naval Architects, by Lord Stonehaven, on Shipping Industry, 414
— — to Institution of Water Engineers, by J. R. Fox, on Water Supply, 691
— — to Iron and Steel Institute, by W. R. Lysaght, on Sheet Industry, 524
— — to Junior Institution of Engineers, by Sir A. Gibb, on Water Power in Great Britain, 24
— — to Sheffield Society of Engineers and Metallurgists, by Prof. F. C. Lea, on Engineering and Metallurgy, 447
Press. See *Machine Tools*
Pressure Balance for High Pressures, Michels, 172*
Prices of Metals. See *Metal-Price Diagrams*
Priestley, J., Bicentenary of, 287
Prime Movers, Mechanical Breakdowns of, 488*, 496, 554*, 582, 661*. See *Erratum*, 596
Princes Risborough, Forest Products Laboratories, Research on Woodworking, 27*; Investigations on Dry Rot and Death-Watch Beetle, 637
"Prinz Regent Luitpold," German Battleship, Salvage of, 545
Producer Gas Engine. See *Engines, Gas*
Production, Census of (1930), Report, 17. See 282
— Costs and Hours of Labour, 681
Projection Apparatus, Writing, Belsazar (C. Zeiss (London), Ltd.), 78
Propeller Experiments with Models of Coasters, 468
Props, Metal, Yieldable, for Underground Support, 665
Propulsion of Ships. See *Marine Propulsion; Engines; Turbines; Propellers; Ship Resistance*
Propulsive Efficiency of Modern Cargo Steamers, 594
Proton and Neutron, Relationship, 377
Public Lighting by Hot-Cathode Tube Lamps, 389*
— Works Construction in United States, Unemployment Relief by, 221
— — Department, New South Wales, Annual Report, 438
Puerto Ingeniero White, Argentina, 80,000-ton Granary at, 147*, 205*, 267*
Puller, Tree Stump, P. & H. (Harnischfeger Corporation), 475*
Pullin, Dr. V. E., on Radium in Engineering Practice, 340*. See 335
Pulman, T. C., the Late, 108
Pulsator for Alternating-Stress Testing Machine, (A. J. Amsler & Co.), 432*
Pulverised Coal, Marketing Scheme for, 703
— — for Cargo Steamers, 394
— — Experiments by Fuel Research Board, 254
— — Firing (Review), 107
— — Firing in S.S. "Nagoya Maru" and S.S. "Johore Maru," 377*
— — Plant (A. Herbert, Ltd.), 242*
— — Plant, Dunston Power Station, 156*
Pulveriser, Ball-Mill, Feed Controller for (Foster Wheeler Corporation), 70*
— Fuller-Bonnet (Babcock & Wilcox, Ltd.), 269
— Resolutor, S.S. "Nagoya Maru," 378*
Pulvis Clutch (British Rema Manufacturing Co., Ltd.), 88*
Pump, Axial-Flow (Foster Wheeler Corporation), 38*
— Car-Washing, Electrically-Driven (B.E.N.), 328*; (Laycock), 396*
— Centrifugal, Automatic Primer for (Skidmore Corporation), 38*
— — Electrically-Driven, Self-Priming (La Bour Co., Inc.), 194*
— — Electrically-Operated, Southampton Graving Dock, 697*
— — Self-Priming (Drysdale & Co., Ltd.), 202*
— Circulating, for Hot-Water Heating Systems, (Holden & Brooke, Ltd.), 448*
— Fire, Trailer (Gwynnes Pumps, Ltd.), 699*
— Fuel, Oil-Engine, Investigation of Action of, 715*
— — 360-b.h.p. Marine Oil Engine, 158*
— — for Oil Engines (Bryce, Ltd.), 128*
— Propeller-Type (De Laval Steam Turbine Co.), 99*
— Rotary Valveless ("Drum" Engineering Co., Ltd.), 460*
— Self-Priming (Gilbert Gilkes & Gordon, Ltd.), 471*
— Slush, Diesel-Driven (Oil Well Engineering Co., Ltd.), 594*
— Vacuum (W. Edwards & Co.), 166
— — Evolution of, 164
Pumping Set, Petrol-Driven (Gwynnes' Pumps, Ltd.), 699*
— — Portable, Petrol-Driven (Drysdale & Co., Ltd.), 700*
— Installation, Sewage, Georgetown, British Guiana, 417
— Plant for Alumina-Production Plant, 593
— — Boughton Reservoir, Chester Waterworks, 377*
— — Southampton Graving Dock, 697*
— Stations, Electrically-Operated, Upper Egypt, 60
— — Langham, South Essex Waterworks Co., 711
— — Sewage, Jamshedpur, India, 417
— — Southend Waterworks Co., 692
— — Storm-Water, Southampton Dock Extensions, 613*
— Vessels, Reclamation, Southampton Dock Extensions, 611*
Punjab, Uhl River Hydro-Electric Scheme, Opening of, 308
Purification of Sewage. See *Sewage*
— of Water. See *Water*
Purifier, Acetylene (C. S. Milne & Co., Ltd.), 355*
— Oil, Centrifugal (Sharples Speciality Co.), 195
Pusher Machine, Coke-Oven and Recovery Plant, Irlam, 539*
— Plant for Can Frames, Grimsby Fish-Dock Ice-Making Plant, 648*
Pyrograph Recorder (Electrofio Meters Co., Ltd.), 242*
Pyrometer, Foundry (Foster Instrument Co.), 186
— Industrial, Chart of, 67*. See *Addendum*, 275
Pyromic Resistance Alloy, 97

Q.

QUAY WALL, Southampton Dock Extensions, 611*
Quenching Station, Coke-Oven and Recovery Plant, Irlam, 540*
— of Steel. See *Heat Treatment* under *Metallurgy*

Quertier, R. L., Nozzles for Air-Flow Measurement, 686
Quicksilver. See *Mercury* and *Metal-Price Diagrams*

R.

RADIAL Drill. See *Drill* under *Machine Tools*
Radiation in Boiler Furnaces, 333. See *Erratum*, 382. See LETTER, 389
— Cosmic, Investigation of, 391
— Solar, Warming Effect on Human Body, 637
Radicon Worm Reduction Gear, 594*
Radio Communication Co., Ltd., 500-ft. Aerial Masts, 543*
— Research, Unification of, 548
Radiological Examination of Engineering Structures, 335, 340*
Radiotelegraphy. See *Telegraphy, Wireless*
Radiotelephony. See *Telephony, Wireless*
Radium in Engineering Practice, 335, 340*
Radon Pumping Apparatus, 340*
Rail and Road Traffic Bill, 438
— — Transport Conference, Replies to Criticisms, 49. See LETTER, 81
— Sawing and Drilling Machine (G. Wagner), 453*
— Steel, Prices. See *Metal-Price Diagrams*
Railroad. See *Railway*
Railway Accidents. See *Accidents*
— American and European, Express Train Speeds on, 459
— Argentine State, 2-8-2 Type Condensing Locomotive, 517*
— Bridge. See *Bridge*
— British, Developments on, 573
— — Oil-Electric Locomotives for, 79, 85*. See *Erratum*, 107
— Buenos Aires Great Southern, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*; 1,700-h.p. Oil-Electric Mobile Power Houses, 328*; 1,700 h.p. Diesel-Electric Locomotive, 328
— Canadian National, Diesel-Engined Locomotives and Rail Coaches on, 265, 454
— Carriage. See *Carriage*
— Club, Model, Exhibition, 470
— Danish State, Diesel-Engined Locomotives and Rail Coaches on, 454*; Electric Traction Equipment for, 476*
— Egyptian, History and Development of (Review), 643
— Electrification in Great Britain, 573, 575
— — in Italy, 175
— Electrified, Rolling Stock for, 226
— Federal, Austrian, Electrification of, 232
— First Passenger, 693*
— French, Locomotive Performances on, 31*
— — State, Three-Cylinder Locomotive, 34*
— Great Western, Developments on, 574
— Hungarian State, Kandó System of Electric Traction, 58*, 296*, 349*
— Indian, Progress of Electric Traction, 133
— Locomotive. See *Locomotive*
— London Midland & Scottish, Developments on, 573; 250-h.p. Diesel-Electric Express Rail Coach, 255. See 281, 330. See LETTERS, 299, 338; Oil-Engined Shunting Locomotives for, 467; "Royal Scot" Train at Chicago World's Fair, 558
— — and North Eastern, Developments on, 573
— Motor Carriage. See *Carriage*
— Operation, Electric Rolling Stock for, 226
— Paris Metropolitan, Developments, 61*, 122*, 319*, 371*, 428*
— Progress of Electric Traction on, 133
— Rolling Stock. See also *Carriages; Locomotives; Wagons*
— Signalling. See *Signalling*
— South Australian Government, Report, 386
— Southern, Brighton Line Electrification, Inauguration of, 19; Progress of Electrification on, 573, 575; Southampton Dock Extensions, 611*, 696*
— Street. See *Tramways*
— Suburban, Copenhagen, Electric Traction Equipment for, 476*
— Swedish State, Economics of Electrification, 133, 449*
— Telsiai-Kretinga, Lithuania, 495
— Traction, Steam, Electric and Diesel-Electric Comparisons, 226
— — Motor-Driven Pneumatic-Tyred Railway Carriages for, 653
— Train Brake. See *Brake*
— — Passenger to Tonnage Ratio on, 281. See 255, 330. See LETTERS, 299, 338
— Transport with Diesel Engines, 265
— Trevithick's Exhibition, London, 1808, 693*
— Tube. See *Underground*
— Underground. See *Underground*
— Wagons. See *Wagons*
— Wheels, Solid-Rolled, Specification, 544
— See also PARAGRAPH INDEX
Rain Cannon (Siemens-Schuckertwerke), 671*
Rainfall of British Isles, 1820–1929, 637
Ransomes & Rapier, Ltd., Steam Dredging Crane, 501*
Rateau Steam Turbine, Use in Warships, 321
Rationalisation of Shipping Tonnage, Proposed, 438
Rayleigh Disc Apparatus for Acoustical Researches, 565
Reactions, Chemical. See *Chemistry*
Reavell & Co., Ltd., Balanced Electrically-Driven Air Compressor, 236*
Recalescence Curves. See *Metallurgy*
Receivers, Steam, Solid-Forged, Battersea Power Station, 90*
Reclamation Work, Southampton Dock Extensions, 611*
Record Electrical Co., Ltd., Continuity Tester, 95*
Recorder, Continuous Chart (Foster Instrument Co.), 95*
— and Controllers, Air-Operated (G. Kent, Ltd.), 209*
— Pyrograph (Electroflo Meters Co., Ltd.), 242*
— Temperature (Negretti & Zambra), 166*
Recorder, Thread (Cambridge Instrument Co. Ltd.), 245*
Rectification Stills, Coke-Oven and Recovery Plant, Iriam, 540*
Reddington, C. G., on Trapezoidal Mass-Concrete Retaining Walls, 644*
Reduction Gears. See *Gears; Marine Propulsion*
Reference Books. See *Annuals*
Reflectors, Non-Glare, Watford By-Pass Road, 679
Refractories in Boiler Furnaces, Properties and Tests, 4*, 34*
— Industries, Mining and Transport of Materials in, 610
— Permeability to Gases, 610
— See also *Firebricks*
Refrigerating Plant, S.S. "Conte di Savoia," 696*
— — Grimsby Fish-Dock Ice-Making Plant, 647*
Refrigeration, Insulating Materials for, 536
— and Low-Temperature Research, 105
— Text-Book on (Review), 537
Regenerative Furnace. See *Furnace*
Regulator, Feed-Water, Three-Element (Bailey Meter Co.), 672*
— Fluid-Flow Ratio, (Drayton Regulator & Instrument Co., Ltd.), 261*
— Temperature and Humidity (Elliott Brothers (London), Ltd.), 52
Reid, Sir J., the Late, 137
Reinecker, J. E., A.-G., Universal Gear-Hobbing Machine, 451*
Reinforced Concrete. See *Ferro-Concrete*
Relay, Protective, for Induction Motors (Nalder, Brothers & Thompson, Ltd.), 95*
— Tractive Armature, Specification, 709
Remuneration of Labour. See *Labour*
Repeated Stresses. See *Alternating Stress* under *Tests* (*Materials*)
Report, Aeronautical Research Committee, 76
— Annual, Atmospheric Pollution Research Committee, 493
— — British Electrical and Allied Manufacturers' Association, 390
— — British Electrical and Allied Industries Research Association, 352
— — Central Electricity Board, 411
— — Chamber of Shipping, 222
— — Fuel Research Board, 254
— — New South Wales Public Works Department, 438
— — Research Council of Alberta, 146
— — Statistical, South Australian Government Railways, 386
— — Water Pollution Research Board, 386
— Board of Trade, Boiler Explosion Inquiries, 233, 621
— Carbonisation of Coal of Relatively Low Coking Power, 717
— Census of Production (1930), 17. See 282
— Deterioration of Structures in Sea Water, 708
— Economic Conditions in Brazil, 600
— — Conditions in Chile, 466
— — Conditions in East Africa, Northern Rhodesia and Nyasaland, 584
— — Conditions in Ecuador, 466
— — Conditions in Italy, 174, 192
— — Conditions in Portuguese East Africa, 674
— on Engineering Quantities, 547
— Forest Products Research Board, 637
— Hydro-Electric Progress in Canada, 526
— Ignition of Fire Damp by Explosives, 110
— Imperial Institute, South Kensington, 1932, 655
— International Tonnage Measurement Regulations, Objections to, 441
— Liquid-Oxygen Explosives, 18
— Mercantile Shipping Crisis, 600. See LETTER, 687
— Municipal Finance in United States, 105
— Nitrate Deposits in United States, 21
— Preservative Treatment of Estate and Farm Timber, 433
— Production and Use of Borates, 647
— Rail and Road Transport Conference, 49. See LETTER, 81
— River Murray Works, Australia, 361
— Safety in Manufacture and Use of Celluloid, 654
— Severn Barrage Scheme, 307, 394*, 599
— South African Electricity Supply Commission, 665
— Steel Castings Research Committee, 557, 589, 638*
— Telephone Progress in London Area, 180
— on Tidal Model of Severn Estuary, 599. See 307, 394‡
— Timber Destruction by Marine Organisms at Sydney, 104
— Trade Conditions in Philippine Islands, 637
— — Conditions in Southern Rhodesia, 584
Research Association, British Electrical and Allied Industries, Annual Report, 352; Researches on Saturated Steam, 707; Annual Luncheon, 223
— — British Rubber Manufacturers', Position of, 259
— — Cast-Iron, British, Desulphurisation and Refinement of Cast Iron, by N. L. Evans, 59
— Board, Forest Products, Researches in Woodworking, 27*; Report, 637
— — Fuel, Annual Report, 254; Report on Carbonisation of Coal of Relatively Low Coking Power, 717
— — Safety in Mines, Report on Liquid-Oxygen Explosives, 18
— — Water Pollution, Annual Report, 386
— Committee, Aeronautical, Report, 76
— — Atmospheric Pollution, Report, 493
— — Coke, Midland, Investigation of Effect of Breeze on Coke Consumption in Blast Furnaces, 525, 531*; Investigation of External Heat Loss of Blast Furnace, 526
— — Fuel, United States, Investigations of Motor Fuels, 465
— — Steel Castings, Report, 557, 589, 638*
— Council of Alberta, Annual Report, 146
— — Iron and Steel Industrial, Report on Steel Castings, 557, 589, 638*
Research Department, Scientific and Industrial, Research in Woodworking, 27*; Report on Severn Barrage Scheme, 307, 394*, 599
— — Woolwich, Radiological Researches at, 335, 340*; Investigations on Steel Castings, 557, 589, 638*
— and Development Lecture on Metals in Life and Industry, 575
— Extra-University, Handbook of, 459
— Laboratory, Acoustics, Metropolitan-Vickers Electrical Co., Ltd., 563*
— Radio, Unification of, 548
— Welding, by Institution of Mechanical Engineers, 277
— in Woodworking, 27*
— See also *National Physical Laboratory*
Reservoir, Boughton, Chester Waterworks Co., 576*
— Compressed-Air, for Circuit-Breaker Operation, 380*
— Krishnaraja, Sivasamudram Hydro-Electric Scheme, 1*
— Ryburn Valley Water Scheme, 692
Resistance, Air. See *Air* and *Aeronautics*
— Electric. See *Electric*
— Pyrometer. See *Pyrometer*
— of Ships. See *Ship Resistance*
— Welding. See *Welding*
Resolutor Pulveriser, S.S. "Nagoya Maru," 378*
Retaining Walls, Concrete, Minimum-Section Trapezoidal, 644*
Retorts, Gas, Brick, Experiments with, 254
Reviews. See LITERATURE INDEX
Reynolds, O., Model Investigation of Rivers and Estuaries, 599
Reyrolle, A., & Co., Ltd., 66-kV. Switchgear, Dunston Power Station, 156; 132-kV Metal-Clad Switchgear, 248*; Flame-Proof Gate-End Switch, 248*; Quick-Action Oil-Immersed Circuit Breaker, 249*
Rhodes, J., & Sons, Ltd., "Simplex" Drawing Device for Power Presses, 241
Rhodesia, Economic Conditions in, Report, 584
Ricardo, H. R., on Petrol and Diesel Engines, 308. See LETTER, 299
Rich, T., on Paris Metropolitan Railway, 61*, 122*, 319*, 371*, 428*
Richards, G., & Co., Ltd., Horizontal Surfacing and Boring Machine, 60*; Boring Gear for Differential Housings, 344*
Richards, H. W. H., on Steam, Electric and Diesel-Electric Traction, 226
Richelieu-Drouot Station, Paris Metropolitan Railway, 62*, 122
Riley Stoker Corporation, Flue-Gas Scrubber, 70*
Rims, Motor-Car Wheel, Standardisation of, 709
Rings, Joint, Gas-Filled (Wills Pressure Filled Joint Ring, Ltd.), 213
— Oil-Sealing, Spring-Fitted (Super Oil Seal Manufacturing Co. (England), Ltd.), 30*
Riseley, H. L., the Late, 259
River Cauvery, India, Metur Dam, 55*; Industrial Developments, 658
— — Sivasamudram Hydro-Electric Scheme, 1*
— Chelmer and Blackwater, Southend Water Supply from 692, 711
— Dee, Cast-Iron Syphon, Chester Waterworks, 577*
— Hooghly Tunnel, 41
— Murray Works, Australia, Report on, 361
— Nene Catchment Board, Steam Dredging Crane, 501*
— Niva, Russia, Hydro-Electric Plant, 430
— Roding Power Transmission Towers, Earth Resistance of, 145*. See *Addendum*, 250
— Severn Barrage Scheme, Report, 307, 394*, 599
— — Investigations with Tidal Model of, 599
— Skagit Hydro-Electric Scheme, 300-ton Overhead Crane Diablo Station, 416*
— Stour, Water Supply from, 711
— Tees Pollution, Investigations of, 386
— Thames, Cable Tunnel, Battersea Power Station, 153
— — Power Transmission Lines, Earth Resistance of Towers, 145*. See *Addendum*, 250
— — Reconditioning of Waterloo Bridge, 165
— — Tidal Floods on, 255
— Uhl Hydro-Electric Scheme, Punjab, Opening of, 308
— Water Supply, Purification by Excess Lime Process, 692, 711
Riveting and Welding Combined, 420, 442
Road Box, Horse, Double (Low-Loading Trailer Co.), 700*
— By-Pass, Watford, Lighting of, 679
— Concrete, Control of Cracks in, 492
— Main, Public Lighting of, 11. See 679
— and Rail Traffic Bill, 438
— — Transport Conference, Replies to Criticisms, 49. See LETTER, 81
— Rollers, 12½-cwt. and 2½-ton Petrol-Driven (Barford & Perkins, Ltd.), 212*
— — Steam, Development of, 642*
— Surfaces, Bitumen Emulsions for, 659*
Roadless Oil-Driven Tractor (Marshall, Sons, and Co., Ltd.), 700*
Roberts, F., the Late, 11
Roberts, H. W., the Late, 218
Robertson, Dr. J. M., on Changes on Heating Hypo-Eutectoid Steels, 541
Robertson, T. S., Fatigue-Testing Machine for Wire, 567*
Robiette, A. G., on Economics of Electric Heating, 284*. See LETTERS, 338*
Robinson, A. E., the Late, 331
Rock, Rear-Admiral G. H., on Education of Naval Architects, 114
Roding River Power Transmission Towers, Earth Resistance, 145*. See *Addendum*, 250
Roe, R. C., on Power Plant Practice for Ships, 111
Roebling Sons' Co., J. A., Static and Dynamic Testing Apparatus, 432*
Roller Path for Marine Turntable Slipway, 561
— Road. See *Road Roller*
Rolling Mills for Aluminium Wire Rod, 473
— — for Sheet Steel, Failures of Rolls, 525
— Stock Committee of Steel Industry, Memorandum on Railway Wagons, 495
Rolling Stock, Paris Metropolitan Railway, 428*
— — See also *Carriages; Locomotives; Wagons*
Rollason, E. C., on Intergranular Corrosion of Austenitic Stainless Steels, 689*. See 615
Rolls, Fatigue Phenomena and Breakage of, 238. See LETTER, 290, 459
Röntgen Ray Examination of Materials, 327, 335, 340
— — Investigation of Copper - Aluminium Alloys, 327
Roof, Sheet-Steel, Arc-Welded Self-Supporting, Albany, New York, 22*
Root Cutter, Motor-Driven, 671*
Ropes, Wire. See *Wire Ropes*
Rotamiser Oil-Fuel Burner, 186
Rotary Calciners, Alumina Production, 592, 626
— Engine. See *Engine; Aeronautics*
— Pump. See *Pump*
Rotor, Phase Converter, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*
— Solid Type, 80,000-kVA Alternator, 668*
Royal Academy Exhibition of British Art in Industry, 387
— Air Force, Modifications in Organisation, 19
— Aircraft Establishment, Research Work, 78
— Agricultural Hall. See *Exhibition*
— — Society. See *Agricultural*
— Meteorological Society. See *Meteorological*

Royal Institution:
Detection and Production of Swift Particles, by Lord Rutherford, 283, 309, 377
Researches on Transmutation of the Elements, by Lord Rutherford, 348
Conversazione, 523
Sounding Plates and Sensitive Flames, by Prof. E. N. da C. Andrade, 523
Low Temperatures and Low-Temperature Phenomena, by Prof. J. C. McLennan, 104, 135, 165, 193

"Royal Scot" Express Train at Chicago World's Fair, 558

Royal Society:
Conversazione and Exhibition, 566*, 591*, 602*
Researches on Saturated Steam, by A. Egerton and G. S. Callendar, 707
Royal Society of Arts. See *Arts*
— — Mond Laboratory, Cambridge, Opening of, 165
Royce, Sir F. H., the Late, 470*
Rubber Manufacturers' Research Association, British, Position of, 259
Rudd *versus* Elder Dempster & Co., Ltd., 662
Rugby Engineering Society, Electric Ship-Propulsion Systems and Control, by G. O. Watson, 236
— Radio Station, 12,000-volt Motor-Generator, 25*
Rule, Nevson, Tangraph (G. Cussons, Ltd.), 448
Russell, R., on Stress Distribution in Welded Plates, 442
Russell, S., & Sons, Ltd., Cold Saw with Hydraulic Feed, 209*; Circular-Saw Grinding Machine, 209*
Russia, British Trade with, 385. See 361, 467. See LETTER, 416
— Machine Construction Programme, 288
— North-West, Hydro-Electric Projects, 430
— Oil Production in, 664
— Progress of Electricity Supply in, 475
— Trade Situation, 361, 467. See 385, 416
Rusting. See *Corrosion*
Ruston-Bucyrus, Ltd., ¾-yd. Drag-Line Excavator, 248
Ruston & Hornsby, Ltd., 16-h.p. Oil-Engined Locomotive, 248; Pumping Installation, Langham, Essex, 711
Rutherford, Lord, on Detection and Production of Swift Particles, 283, 309, 377; on Transmutation of the Elements, 348
Ryburn Valley Water Scheme, Concrete Dam, 692

S.

SACCAGGIO, P. C., 1,700-h.p. Oil-Electric Mobile Power Houses and Locomotive, 328*
Sack-Handling Plant, 80,000-ton Granary, Bahia Blanca, 267*
Safety Catches for Mine Cages and Skips, Dangers of, 426*
Safety First Association, National, London Congress, 506; Work of, 574
— in Mines Research Board, Report on Liquid-Oxygen Explosives, 18
Saint. See *St.*
Sales Managers' Association, Incorporated, Manual on "Even Better Selling," 255
Salford Electrical Instruments, Ltd., Exhibit at Physical Society's Exhibition, 167
— Main Roads, Lighting of, 11
Salter, G., & Co., Ltd., Spring Balances, 245
Salvage of S.S. "Segovia," 113
— of German Battleship "Prinz Regent Luitpold," 545
Sames, C. M., the Late, 389
Sand, Bulking of, Effect on Concrete Costs, 19
— Drier, Oil-Fired (Constructional Engineering Co., Ltd.), 551*
— Mixer, Continuous-Operation (Fordath Engineering Co., Ltd.), 487*
"Santa Rosa," S.S., 12,000-s.h.p. Geared Turbines, 112
Saturators, Ammonia, Coke-Oven and Recovery Plant, Iriam, 540*
Saunders, O. A., Heat Transfer Measuring Apparatus, 568
Savage Brothers, 8-h.p. Traction Engine, 640
Savoy, France, Ugine Steel Works, Researches on Dephosphorisation and Deoxidation of Steel at, 488 674. See 171
Saws. See *Machine Tools*
Saxton, R., Steel Wire Drawing, 608*
Scalecometer Micrometer (W. Ottway & Co., Ltd.), 78

Scammell Lorries, Ltd., Detachable Tractor for Road Vehicles, 633*
Schiess-Defries, A.-G., Vertical Boring Machine, 294*; Tool Dynamometer, 294*; Double-Headed Tool-Grinding Machine, 325*; Horizontal Boring Machine, 402*
Schilovsky, Dr. P., on Gyroscopes Required to Stabilise a Ship, 470. See 345*, 507*. See LETTERS, 53, 107, 578. See *Erratum*, 596
Schlieren Method for Study of Ignition, 110
Schmaltz, F., G.m.b.H., Crankshaft-Grinding Machine, 323*; Surface-Grinding Machine 325*. See *Erratum*, 388
Schofield, T. H., on Influence of Volatile Chlorides on Magnesium and Copper, 675. See 363
Scholarships. See *Education*
Schuster, L. W., on Breakdowns of Prime Movers and Boiler Plant, 488*, 554*, 661*. See 496, 582. See *Erratum*, 596
Schütte, A. H., Slot-Milling Machine, 451*
Science Museum Library, South Kensington, Reference Indexes at, 122
— — South Kensington, Exhibition of Photo-Electric Cells, 387; Plastics Industry Exhibition, 523
— Universe of (Review), 106
Scientific Apparatus Exhibition, Physical Society's, 49*, 77*, 94*, 166*, 261*; Royal Society Conversazione, 566*, 591*, 602*
— Instruments, Early, Ashmolean Museum, Oxford, 533*
— — Early English, 566
— Management. See *Works Management*
— Papers, International Indexing of, 119
— Research. See *Research*
— Societies. See *Institutions*
— Workers, Association of, Handbook of Extra-University Research, 459
Scleroscope Tests. See *Hardness* under *Tests* (*Materials*)
Scolo Pipe-Bending Machine, 550*
Scotland, Aluminium Industry in, 592*, 628, 633*
— Grampian Hydro-Electric Power Scheme, 24,000-h.p. Turbines, 511*; Loch Ericht Development Scheme, 607
— Industrial Revolution in (Review), 613
— Institution of Engineers and Shipbuilders in. See *Engineers*
Scottish Power Co., Ltd., Loch Ericht Hydro-Electric Scheme, 607
— Society of Arts, Trend of Modern Engineering, by Dr. R. Lessing, 165
Screw-Cutting Lathe. See *Lathe* under *Machine Tools*
— Propellers. See *Propellers*; *Aeronautics*
Screwing Machine. See *Machine Tools*
Scrubber, Flue-Gas (Riley Stoker Corporation), 70*
Sea Water, Deterioration of Structures in, 104, 187, 217
Seasoning Timber, Investigations, 637
Seattle, Washington, Bascule Bridge with Open-Mesh Decking, 636*
Secondary Battery. See *Accumulator* under *Electric*
— Schools and Education. See *Education*
"Segovia," S.S., Salvage of, 113
Segregations, Weakness Caused by, 488*, 582
Sejersted, J., on Sulphur and Phosphorus and the Corrosion of Iron, 590
Selborne-Fisher Scheme of Naval Training, 657
Selling Manual for Sales Managers, 255
Sensitive Drill. See *Drill* under *Machine Tool*
Separation and Precipitation Plant for Sludge (W. Boby, Ltd.), 243*. See *Erratum*, 305
Separators, Acid, Coke-Oven and Recovery Plant, Irlam, 540*
— Disc, Carter, 80,000-ton Granary, Bahia, Blanca, 205*
— Oil, Grimaby Fish-Dock Ice-Making Plant, 648*
Severn Barrage Scheme, Reports, 307, 394*, 599
Sewage Effluent, Use in Cooling Towers, New Blackburn Meadows Power Station, 702*
— Pumping Installation, Georgetown, British Guiana, 417
— — Stations, Jamshedpur, India, 417
— Treatment in Great Britain, America and Germany, 163
— See also PARAGRAPH INDEX
Sewerage and Sewage Treatment (Review), 63
Sezewa, Dr. K., on Stress Distribution in Solids, 695*
Shaft Coupling. See *Coupling*
— Crank. See *Crankshaft*
— for Electric Motors, 191
— Fracture of, Investigations, 489*, 496, 554*, 582, 661*, 685*
Shaping Machine. See *Machine Tools*
Sharples Speciality Co., Centrifugal Oil Purifiers, 195
Shave, G. J., the Late, 156
Shear Tests. See *Tests* (*Materials*)
Shearing Machine. See *Machine Tools*
Sheds, Passenger and Cargo, Southampton Dock Extensions, 613*
Sheet-Pile Cofferdam, Steel, Ford Motor Works, Dagenham, 169
— Steel Industry, History and Position of, 524
— — Roof, Arc-Welded, Self-Supporting, Albany, New York, 22*
— — Normalised, Formation of Columnar Crystals in, 542
— — Sherrite, Production of, 584
Sheffield Chamber of Commerce, Book on Sheffield Industries, 655
— New Blackburn Meadows Power Station, 378*, 456*, 701*
— Society of Engineers and Metallurgists, Presidential Address on Relationship of Engineering to Metallurgy, by Prof. F. C. Lea, 447
Shell-Mex and B.P., Ltd., Exhibits at British Industries Fair, 182*, 212*, 242*; 250-h.p. Diesel-Electric Express Rail Coach, 255, 330. See 281. See LETTERS, 299, 338
Sherley-Price, H., the Late, 54
Sherrite Steel Sheets, Production of, 584
Shetland Water Mills, 292
Shield, Gun, 6-in. (Hadfields, Ltd.), 638*. See 557, 589
Shihara Sangyo Kaiun Goshi, S.S. "Johore Maru" and "Nagoya Maru," Pulverised-Fuel Firing Tests, 377*
Ships, Cargo, Improved Forms of, 393*, 415
— — Types of Machinery for, 112
— — Water-Tube Boilers for, 333. See *Erratum*, 382. See LETTER, 389
— Coasting, Propeller Experiments with Models of, 468
— Constructed in 1932, 24, 45, 101
— Construction, Arcform Method, 415
— — Electric Welding in, 359, 419*, 442
— under Construction, Lloyd's Statistics, 79, 413
— Damaged, Stability of, 111
— Diesel-Engined. See *Motor Ships*; *Marine Propulsion*
— Electric Propulsion. See *Marine Propulsion*
— Exhibition (Overseas Marketing Service, Ltd.), 334
— Fires, Prevention of, 49
— Gyroscopic Stabilisation, 54, 107, 345*, 470, 507*, 578. See *Erratum*, 596
— Launched, Lloyd's Statistics, 234, 413
— Model Experiments. See *Ship Resistance*
— Motor. See *Motor Ships*; *Marine Propulsion*
— Performance, Effect of Wind on, 467
— Propellers. See *Propellers*
— Propulsion. See *Marine Propulsion*; *Engines*; *Turbines*; *Propellers*
— Reclamation Pumping, Southampton Dock Extensions, 611*
— Refrigerating Materials in, Heat Transmission through, 537
— Repairing and Re-conditioning of, 134
— Resistance, Effect of Local Hollowing Forward, 469
— Salvage of. See *Salvage*
— Stability after Damage, 111
— Structural Details, Accidents Caused by, 111
— Tonnage Measurement of, 415, 441
— Vibrations in, Method of Minimising, 445*. See 485
— Wake, Mechanism of, 469
— Welding of Longitudinal Seams, 111
— See also *Marine*; *Motor Ships*; *Shipping*; *Steamers*; *Warships*; and PARAGRAPH INDEX
Shipbuilders and Engineers, North-East Coast Institution of. See *North-East Coast*
— — in Scotland, Institution of. See *Engineers*
Shipbuilding in 1932, 24, 45, 101
— Arcform Form of Hull, 415
— Construction Details, Accidents Caused by, 111
— Design of Submarine Hulls, 484
— Effect of Local Hollowing Forward, 469
— Electric Welding in, 359, 419*, 442. See 111
— Improved Forms of Cargo Steamers, 393*, 415
— Industry, Position of, 414
— Naval. See *Warships*
— S.S. "Conte di Savoia," 345*, 607
— and Ship-Repairing, 134
— and Tonnage Measurement, 441
— Vessels under Construction, Lloyd's Statistics, 79, 413
— — Launched, Lloyd's Statistics, 234, 413
— Welding Longitudinal Seams of Ships, 111
— See also *Steamers*; *Naval*; *Warships*; and PARAGRAPH INDEX
Shipping, Chamber of, Annual Report, 222
— Coastal, and Traffic Problem, 467
— Coastwise, 600. See LETTER, 687
— Crisis, Mercantile, Report, 600. See LETTER, 687
— Galleries, 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*
— Idle Tonnage, Statistics, 413
— Industry, Position of, 222, 414
— — and Tonnage Measurement, 441
— and Naval Annual, Brassey's (Review), 601
— Tonnage, Proposed Rationalisation of, 438
Shock Tests. See *Impact Tests* under *Tests* (*Materials*)
Shop Management. See *Works Management*
Shore Scleroscope Tests. See *Hardness* under *Tests* (*Materials*)
Shovel, Steam. See *Excavating Machine*
Show. See *Exhibition*
Shuttering for Quay Wall, Southampton Dock Extensions, 613*
Sidings, Marshalling, Southampton Dock Extensions, 613*
Siemens-Martin Furnaces. See *Furnaces*
Siemens-Schuckertwerke, Rain-Cannon, 671*; Benson Boilers, 682
Siemens-Schuckert (Great Britain), Ltd., Tube-Well Pumping Plant, Southampton, 697
Sieves, Standard, the Tenth Root of Ten as an Aperture Ratio for, 65*
Signalling on British Railways, 573
— Railway, Electric Lamps for, Specification, 179
— — Tractive-Armature Relays, Specification, 709
— System, Paris Metropolitan Railway, 320
Signals, Colour Light, Traffic Control, Trafalgar Square, London, 388*. See 596
Silicon in Aluminium, Determination of, 327
— Carbide Refractories for Boiler Furnaces, 36*
Simon, H., Ltd., 80,000-ton Granary, Bahia Blanca, 147*, 205*, 267*; Model Vertical Garage, 246*
Simplex Drawing Device for Power Presses, 241
Simpson, W., the late, 71
Singleton, W., on Properties of Tellurium-Lead, 317*. See 310
Sintering Practice in American Iron and Steel Works, 503, 541
Sivasamudram Hydro-Electric Scheme, 1*
Skagit River Hydro-Electric Scheme, 300-ton; Overhead Crane, Diablo Station, 416*
Skidmore Corporation, Automatic Primer for Centrifugal Pumps, 38*
Skinner, F. W., the late, 54
Skip, Concrete-Pouring (R. Hudson, Ltd.), 212*
— Mine, Dangers of Safety Catches for, 426*
Slabs, Ferro-Concrete, Deformation and Cracking of, 686
Slag Attack, Refractories in Boiler Furnaces, 34
Slide Rule, Compound Interest (A. G. Thornton, Ltd.), 277
Slipway, Turntable, Marine, 650-ton, at Lorient, 559*, 620*
Slotting Machines. See *Machine Tools*
Sludge Press, Boughton Reservoir, Chester Waterworks, 577*
— Separation and Precipitation Plant (W. Boby, Ltd.), 243*. See *Erratum*, 305
— See also *Sewage*
Sluice Dam, Severn Barrage Scheme, 307, 395*, 599
Slurry Tower and Washery, Coke-Oven and Recovery Plant, Irlam, 539*
Smelting Furnaces. See *Furnaces*
Smith, A. R., on Turbines for Panama Mail Steamers, 112
Smith, C. C., Ryburn Dam, Wakefield Water Scheme, 602
Smith, Engr.-Capt. E. C., on R. Trevithick, 106. See 439*, 459, 463, 467, 693*; on Naval and Marine Engineering History, 321, 561, 657
Smith, Sir F., on Travel of Wireless Waves, 494
Smoke Abatement in the 17th Century, 626
— — Society, National, Views on Domestic Smoke, 387
— and Atmospheric Pollution, 493
— Detection by Photo-Electric Cells, 387
Smokeless Fuel. See *Coal*, *Low-Temperature Carbonisation*
Societies, Technical and Scientific. See *Institutions*
— Trade. See *Labour*; *Labour Notes*
Soda Ash, Desulphurisation of Cast Iron by, 59
Soffionissimi, Tuscan, Utilisation of, 522
Softener, Water. See *Water Softener*
Soil-Conductivity Bridge (Cambridge Instrument Co., Ltd.), 50*
— Heating, Electric Cables for (Allgemeine Elektricitäts Gesellschaft), 671*
— — by Electricity for Tomato Culture, 92
— Thermal Conductivity of, 537
Solar Radiation, Warming Effect on Human Body, 637
Sopwith, D. G., on Corrosion-Fatigue Tests, 542
Sound Transmission Investigations, Acoustics Laboratory, Metropolitan-Vickers Electrical Co., Ltd., 565*
Sounding Gear, Echo, Marine (H. Hughes & Son, Ltd.), 96
— Plates and Sensitive Flames, 523
South Africa, Cape Town Broadcasting Station, 46
— — Electricity Supply Commission, Progress of, 665
— Australian Government Railways, Annual Report, 386
South Essex Waterworks Co., Stour Scheme, 711
— Kensington, Imperial Institute Report, 1932, 655
— — Royal School of Naval Architecture, History of, 562
— — Science Museum, Exhibition of Photo-Electric Cells, 387; Plastics Industry Exhibition, 523
— West, Notes from, 14, 45, 73, 101, 131, 161, 188, 219, 251, 278, 304, 330, 357, 383, 409, 434, 463, 491, 519, 545, 571, (See *Erratum*, 597), 596, 623, 651, 679, 705. See PARAGRAPH INDEX
— Yorkshire, Notes from, 15, 44, 73, 100, 130, 160, 189, 218, 250, 279, 304, 331, 356, 383, 408, 435, 463, 490, 519, 544, 571, 597, 623, 651, 679, 705. See PARAGRAPH INDEX
Southampton Dock Extensions, 611*, 696*
— Power Station, Circulating Water Culverts, 613*
Southend-on-Sea Meeting of Institution of Water Engineers. See *Water Engineers, Institution of*
Southend Waterworks Co., Chelmer and Blackwater Schemes, 692, 711
Southern Railway, Brighton Line Electrification, Inauguration of, 19; Progress of Electrification on, 133, 573, 575; Southampton Dock Extensions, 611*, 696*
Spalling of Refractories in Boiler Furnaces, 6*
Sparks, C. H., on Benson Boiler, Langerbrugge, 11
Specific Gravity Determination Apparatus for Oil containing Gas, 686
— Heat of Steam at Zero Pressure, 707
Specifications, Standard. See *Standards*; *Standardisation*
Spectrophotometry, Notched Echelon Cells for (A. Hilger, Ltd.), 96*
Speed-Changing Gears. See *Gears*; *Gearing*; *Marine Propulsion*
Spelter Prices. See *Metal-Price Diagrams*
Spencer-Bonecourt High-Velocity Boiler, 616*
Spencer Turbine Co., Portable Vacuum Cleaner, 39*; 5-h.p. Turbo-Compressor, 39*
Spheres, Electrically-Welded (Chicago Bridge & Iron Works), 688*
Spherical Heterogeneity, Effect on Stress Distribution, 695*
Spiral Tube and Components Co., Combined Water and Oil Cooler, 287*
Spirit, Motor. See *Motor Fuels*
Spline Shaft, Failure of, 661*
Springs, Steam, of Tuscany, Industrial Application, 522
Spur Gearing. See *Gears*; *Gearing*; *Marine Propulsion*
St. Louis County Gas Co., Electrically-Welded Gas-Mixing Tank, 688*
Stability of Ships. See *Ships*
Standard Code, Canadian, Electrical Apparatus, 223. See *Errata*, 249
— Sieves, the Tenth Root of Ten as an Aperture Ratio for, 65*
Standard Telephones and Cables, Ltd., Cathode-Ray Oscillograph Apparatus, 167, 602; Moving-Coil Microphone, 168; Bethnal Green Automatic Telephone Exchange, 316*
Standardisation of Aerodrome Lighting, 105
— European, of Iron and Steel, 136
— of Motor Tyres and Rims, International Conference, 709
Standardised Natural Asphalt, 79
Standardising Associations, National, International Federation of, Düsseldorf Conference, 136
Standards, American Bureau of, Investigation of Properties of Saturated Steam, 707
— Institution, British, Standard Specification for Electric Overhead Travelling Cranes, 7; Tungsten-Filament Lamps, 30; Chemical Pipe Lines, Identification Plates, 101; Marking and Colouring Foundry Patterns, 140; Tests of Zinc Coatings on Galvanised Wires, 175; Electric Lamps for Railway Signalling, 179; Mains-Operated Electric Clocks, 309; Solid-Rolled Railway Wheels, 544; Steel Telegraph and Telephone Poles, 605; Enamelled Copper Wire, 650; Definitions for Fire Resistance of Building Materials and Structures, 651; Air-Break Switches, 668; 'Bus Bars, 678; Electric Ceiling Fans, 679; Flame-Proof Plugs and Sockets, 680; Pipe Flanges, 698; Tractive-Armature Relays, 709
Stanley, R. C., on Canadian Nickel Industry, 413
Stanley, W. F., & Co., Ltd., Planimeter and Pole Wagon, 419*
Stanton Ironworks Co., Ltd., Cast-Iron Paving, 174*
Starters, Motor. See *Motors, Electric*
State Railways. See *Railways*
"Stassfurt," S.S., Furnace Water-Walls in Boilers of, 12*
Stations, London Underground Railways, Improvements in Artificial Lighting, 675
— Paris Metropolitan Railway, 61*, 122*, 319*
— Power. See *Power Stations*
Stator, Welded-Steel Frame, 80,000-kVA Alternator, 668*
Steam Boats. See *Steamers*
— Boilers. See *Boilers*
— Chest, High-Pressure, 67,200-kW Steam Turbine, 668*
— Drums, Welded, Testing of, 328*
— Engines. See *Engines*
— Flow through Nozzles. See *Nozzles*
— High-Pressure and Temperature, Use in Ships, 112
— — Pressure, Use by Trevithick, 441, 459
— Jets, Production of Vacuum by, Experiments on, 230*, 255*, 262*
— and Molten Copper, Reaction between, 363
— Navvy. See *Excavating Machine*
— Pipe, 26-in., for High Pressures, New Blackburn Meadows Power Station, 701*
— Roller. See *Road Roller*
— Saturated, Relation between Pressure and Temperature, 707
— Shovel. See *Excavating Machine*
— Springs of Tuscany, Industrial Application of, 522
— Superheater. See *Superheater*
— Tables, International, 707
— Tractors. See *Tractors*
— Trap, Gestra (S. R. Golding & Co.), 691*
— Trawler "Frida Sophia," Boiler Explosion in, 621
— Turbines. See *Turbines*
Steamers, Atlantic, Telephone Communication with, 181
— Cargo, Improved Forms of, 393*, 415
— — Types of Machinery for, 112
— — Water-Tube Boilers for, 333. See *Erratum*, 382. See LETTER, 387
— Constructed in 1932, 24, 45, 101
— under Construction, Lloyd's Statistics, 79, 413
— "Conte di Savoia," 345*, 423*, 507*, 606*, 650; Gyroscopic Stabilisers, 345*, 507*. See 54, 107, 470, 578. See *Erratum*, 596
— Electric Propulsion. See *Marine Propulsion*
— Geared Turbines for. See *Marine Propulsion*
— Hamburg-America Line, Furnace Water-Walls for Boilers, 12*
— "Johore Maru," Pulverised-Fuel Trials, 377*
— "L'Atlantique," Fire on, 49
— Launched, Lloyd's Statistics, 234
— "Mari," Boiler Explosion in, 233
— "Mariposa" and "Monterey," Performances of, 113
— "Nagoya Maru," Pulverised-Fuel Trials, 377*
— "Normandie," ATV Steel Blading in, 289
— Propulsion of. See *Marine Propulsion*; *Engines*; *Turbines*; *Propellers*
— Repairing and Re-conditioning of, 134
— Resistance of. See *Ship Resistance*
— Salvage of. See *Salvage*
— "Santa Rosa," 12,000-s.h.p. Geared Turbines, 112
— "Segovia," Salvage of, 113
— Stability of. See *Ships*
— Turbo-Electric, Twenty-Fifth Anniversary of, 520
— "Uckermark," Benson Boilers, 112, 682
— "Vespasian," Geared Turbines of, 322
— See also *Engines*; *Marine Propulsion*; *Shipbuilding*; *Shipping*; *Ships*; *Turbines*; *Warships*; PARAGRAPH INDEX
Steamships. See *Ships*; *Steamers*; *Warships*
Steel Alloys, Use in Engineering, 447
— Application to Structures, 447
— ATV Non-Corroding, 289*
— Austenitic, Properties of, 615
Steel Band Conveyor and Engineering Co., Ltd., Coal-Discharging Plant, Gothenburg Harbour, 687*
— Bridges, Design of (Review), 295. See LETTERS, 416, 459
— Castings, Large (Hadfields, Ltd.), 638*. See 557, 589
— — Research Committee, Report, 557, 589, 638*
— Chromador High-Tensile (Dorman, Long & & Co., Ltd.), 275
— Corrosion. See *Corrosion*
— Fatigue of. See *Alternating Stress* under *Tests* (*Materials*)
— Foundry. See *Foundry*
— Furnaces. See *Furnaces*
— Hardening of, Application of Thermo-Magnetic Cycle, 67*. See *Addendum*, 275

Steel, Heat Treatment of. See *Heat Treatment* under *Metallurgy*
— High-Tensile, Electric Welding of, 419
— Hypo-Eutectoid, Changes on Heating, 541
— Industry Rolling Stock Committee, Memorandum on Railway Wagons, 495
— for Internal-Combustion Engine Valves, 55*, 83*, 580*, 615
— and Iron Industry, Reorganisation of, 412
— Manufacture. See *Metallurgy*
— Microstructure of. See *Microphotographs*
— Plates, Electric Welding of, 419*, 442
— — Prices. See *Metal-Price Diagrams.*
— Process, Basic, in France, Jubilee of, 171. See 488, 674
— — Bessemer, Discovery of, 171
— Production in France, 172
— Quenching and Tempering Phenomena in, 549
— Rails. See *Rails*
— Rapid Dephosphorisation and Deoxidation of, 488, 674. See 171
— Rolling Mills. See *Rolling Mills*
— Stainless, Intergranular Corrosion of, 615, 689*
— Sheet Industry, History and Position of, 524
— — Normalised, Formation of Columnar Crystals in, 542
— — Pile Cofferdam, Ford Motor Works, Dagenham, 169
— — Sherrite, Production of, 584
— Stress Distribution in. See *Stress; Tests (Materials)*
— Tests of. See *Tests (Materials)*
— Wire Drawing, 608*
Steering Gear, S.S. "Conte di Savoia," 606*
Steiger and Cockerell, 7-h.p. Two-Stroke Oil Engine, 312*. See *Addendum*, 331
Stellite for Protection of Internal-Combustion Engine Valves, 84*
Stephanschenko, M., River Niva Hydro-Electric Power Plant, 430
Sterilising Chest, Electrically-Operated (General Electric Co., Ltd.), 700*
Sterling Engine Co., 115-h.p. Petrol-Driven Generating Set, 70*
Stimson, H. F., on Properties of Saturated Steam, 707
Stirling Boiler Co., Ltd., Boilers, New Blackburn Meadows Power Station, 457*
Stills Rectification and Wash Oil, Coke-Oven and Recovery Plant, Iriam, 540*
Stockholm-Göteborg Railway Electrification, 449*
Stokers, Mechanical, Chain-Grate, New Blackburn Meadows Power Station, 457
— — Dunston Power Station, 156*
— — Taylor, Battersea Power Station, 90*
— — Use at Sea, 334
Stonehaven, Lord, on Shipping Industry, 414
Stop Valves. See *Valves*
Storage Battery. See *Accumulator* under *Electric*
Storing and Handling of Grain, 136, 141*, 199*, 568*
Storström Highway and Railway Bridge, Denmark, 497*
Stour River, Water Supply from, 711
Stoves, Hot-Blast, American, 502*
Strainer, Wire, Monkey (Trewhella Brothers Proprietary, Ltd.), 700*
Straker, E., on Shetland Water Mills, 292
Strauss, F., on Transportation in Austria, 232
Streamline Motor-Cars, 521
Street, Dr. A. C., on Effect of Hydrogen and Oxygen on Copper-Nickel Alloys, 363
Street Lighting by Hot-Cathode Lamps, 369*
— Railway. See *Tramways*
— See also *Roads*
Strength of Materials. See *Stress* and *Tests (Materials)*
Stress, Alternating and Combined. See *Tests (Materials)*
— Distribution, Effect of Local Heterogeneity, 695*
— Fatigue, and Breakage of Rolls, 238. See LETTER, 299, 459
— Repetitions. See *Alternating Stress* under *Tests (Materials)*
— due to Sharp Corners, 451*
— Strain and Ductility Diagrams, Lead Alloys, 315*
— in Water-Cooled Piston Rods for Oil Engines, 484
— in Welded Steel Plates and Joints, 419, 442
Strikes. See *Labour; Labour Notes*
Strips, Copper and Brass, Hardness Tests of, 364, 367*
Structural Design, Influence of Earthquakes on, 478
— Engineering and Architecture, 334
— — Industry, Position and Prospects, 443
— Engineers, Institution of, Annual Dinner 334; Portland House Travelling Scholarship, 391
— Steel Buildings (Review), 123
Structures, Application of Iron and Steel to, 447
— Definitions for Fire Resistance of, 651
— Engineering, Effect of Earthquakes on, 478
— Ferro-Concrete. See *Ferro-Concrete*
— Sea, Preservation against Marine Borers, 187, 217
Stump Puller, Tree, P. & H. (Harnischefeger Corporation), 475*
Submarine Boats. See *Warships*
Subsidies, Shipping, Effect of, 222
Substations, Austrian Federal Railways, 232
— 80,000-ton Granary, Bahia Blanca, 147*, 268*
— Grid, New Blackburn Meadows Power Station, 456*
— Hungarian State Railways, 58*
— Paris Metropolitan Railway, 321*, 371
— Swedish State Railways, 449
Subways, Cable, Paris Metropolitan Railway, 371*
Suckling, Dr. E., on Excess Lime Water Purification Process, 692, 711
Sullivan, H. W., Ltd., Exhibits at Physical Society's Exhibition, 168
Sulphate Bagger, Coke-Oven and Recovery Plant, Iriam, 540*
Sulphur Compounds as Inclusions in Steels, 528*, 589
Sulphur in Iron, Effect on Corrosion, 590
— Prints of Fractures, 554*, 582, 602
Sulzer Bros., 850-b.h.p. Eight-Cylinder Diesel Engines for Mobile Power Houses, 328*
Sun. See *Solar*
Sunbeam Motor Car Co., Ltd., Internal-Spline Honing Machine, 714*
Sunlight, Effect of Atmospheric Pollution, 493
Super Oil Seal Manufacturing Co. (England), Ltd., Spring-Fitted Oil Sealing Ring, 30*
Superheater Co., Superheater for Return-Tube Boilers, 70
— for Horizontal Return Tube Boilers, 70
— Locomotive. See *Locomotive*
— for Naval Water-Tube Boilers, 483
— New Blackburn Meadows Power Station, 457
Surface Condensers. See *Condensers*
— Grinding Machine. See *Grinding* under *Machine Tools*
Surge Tank Installations and Model Experiments, 116
Surveying Instruments, Early, at Ashmolean Museum, Oxford, 533*
Sweden, Gothenburg Harbour, Coal-Discharging Plant, 687*
Swedish Penta Works, Marine Motor for High Altitude, 15
— State Railways, Economics of Electrification of, 133, 449*
"Swell" of Water in Boilers, Tests on, 672*
Swing Bridge. See *Bridge*
Swinney Brothers, Ltd., Oil-Fired Heating Furnace for Bottle Necks, 183*
Switchboard Instruments, Small-Case (Metropolitan-Vickers Electrical Co., Ltd.), 571
Switches, Air-Break, Specification, 668
— Motor Starting. See *Motors, Electric*
Switchgear, 66-kV, Battersea Power Station, 152*
— Bus Bars, Specification, 678
— Circuit Breakers, Arc Control in, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
— — Breaker, 11-kV 200-ampere (Harland Engineering Co., Ltd.), 249*
— — Breaker Design, Developments in, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
— — Breaker, 2,500-h.p. Electric Locomotive, Hungarian State Railways, 296*
— — Breakers for Electric Rail Coaches, Copenhagen Railways, 477*
— — Breaker, 400-ampere Oil-Break (M. & C. Switchgear, Ltd.), 215*
— — Breakers, Oil, New Blackburn Meadows Power Station, 379*
— — Breaker, Pole-Mounted (G. Ellison, Ltd.), 216*
— — Breaker, Quick-Action Oil-Immersed (A. Reyrolle & Co., Ltd.), 249*
— — Breaker, Solenoid-Operated Air-Break (I-T-E Circuit Breaker Co.), 195*
— 5-kVA Combined Switch and Transformer (English Electric Co., Ltd.), 274*
— Compressed-Air Operated, New Blackburn Meadows Power Station, 378*
— Contactor-Starter, Push-Button (M. & C. Switchgear, Ltd.), 215*
— 66-kV, Dunston Power Station, 156
— Gate-End Box, Flame-Proof (A. Reyrolle & Co., Ltd.), 248*
— Hungarian State Railways, 58*, 350*
— Loch Ericht Hydro-Electric Scheme, 608
— 132-kV Metal-Clad (A. Reyrolle & Co., Ltd.), 248*
— Pole-Mounted Kiosk for (Ferguson, Pailin, Ltd.), 234*
— Ring-Main Control Unit (Crompton Parkinson, Ltd.), 274*
— Starters for Squirrel-Cage Motors (English Electric Co., Ltd.), 274
— Switchboard, Truck-Type (Harland Engineering Co., Ltd.), 249*
Swope Scheme of Unemployment Insurance, 222
Sydney Harbour Trust, Report on Timber Destruction in Sea Water, 104
— — Bridge, Souvenir of, 430
Symbols, German, for Welding, 479*
Symons Lecture on Cosmic Radiation, 391
Syphon, Cast-Iron, River Dee, Chester Waterworks, 577*
— Flow, Laws of, 115
Systems, Shop. See *Works Management*

T.

TAGLIABUE Manufacturing Co., Magnetic-Clutch Flow Controller, 582*
Tangraph Rule, Nevson, 448
Tangye, Sir R., Centenary of, 81
Tangyes, Ltd., 120-h.p. Six-Cylinder Oil Engine, Tests of, 204*
Tank Experiments on Cargo Steamers, 393*, 415
— — on Effect of Local Hollowing Forward, 469
— — Propellers for Coasting Vessels, 468
— Flushing and Storage, Coke-Oven and Recovery Plant, Iriam, 540*
— Gas-Mixing, Electrically-Welded, 688*
— Ice-Making, Grimsby Fish-Dock Ice-Making Plant, 648*
— Locomotives. See *Locomotives*
— Ships, Motor. See *Motor*
— Steamers. See *Steamers*
— Surge, Installations and Model Experiments, 116
— Welded-Steel, for Circuit-Breakers, 380*
Tar-Recovery Plant, Coke-Oven Plant, Iriam, 540*
Tavannes Watch Co., Automatic Lathe, 619*
Taxation of Advertisement Matter, Memorandum on, 627
— of Oil Fuel, Effect of, 523, 575, 683
Taylor Brothers, Toggle-Operated Disc-Type Friction Clutch, 292*
Taylor & Challen, Ltd., Crank-Operated Balanced Press, 241*; Crank-Operated Turntable-Feed Press, 241*; Bending and Punching Press, 277*
Taylor Mechanical Stokers, Battersea Power Station, 90*
Teaching. See *Education*
Technical College and Education. See *Education*
— Papers, International Indexing of, 119
— Societies. See *Institutions* and PARAGRAPH INDEX
Technocracy, Views on, 48
Tees, River, Pollution, Investigations of, 386
Telcon and Telconstan Resistance Materials (Wild-Barfield Electric Furnaces, Ltd.), 97
Telecontrol Gear, Hydraulic (Dr. H. S. Hele-Shaw and T. E. Beacham), 591*
Telegraph Construction and Maintenance Co., Ltd., Exhibits at Physical Society's Exhibition, 169
Telegraphy, Wireless, 300-watt Marine Transmitter (Marconi's Wireless Telegraph Co., Ltd.), 167
— — Radio Department, National Physical Laboratory, 548
— — Rugby Radio Station, 12,000-volt Motor Generator, 25*
— — Short-Wave Demonstration Apparatus (Marconi's Wireless Telegraph Co., Ltd.), 166*
— — Travel of Wireless Waves, 494
— See also *Electricity* in PARAGRAPH INDEX
Telephone, Automatic, Use of Photo-Electric Cells with, 387
— Exchange, Automatic, Bethnal Green, 316*
— Progress in London Area; 1932, 180
— Transmission Theory (Review), 404
Telephony (Review), 373
— Automatic, By-Path System of, 316*
— Wireless, Cape Town Broadcasting Station, 46
— — Communication with Ships, 181
— — 300-watt Marine Transmitter (Marconi's Wireless Telegraph Co., Ltd.), 167
— — Moving-Coil Microphone (Standard Telephones & Cables, Ltd.), 168
— — New Radio Department, National Physical Laboratory, 548
— — Rugby Radio Station, 12,000-volt Motor Generator, 25*
— — Short-Wave Demonstration Apparatus (Marconi's Wireless Telegraph Co., Ltd.), 166*
— — Travel of Wireless Waves, 494
— — West Regional Broadcasting Station, 542*
— See also *Electricity* in PARAGRAPH INDEX
Telescopes at Ashmolean Museum, Oxford, 533*
Tellurium-Lead, Properties of, 310, 317*
Telsial-Kretinga Railway, Lithuania, 495
Temperature Control in Electric Furnaces, 284*. See LETTERS, 338*
— and Humidity Regulator (Elliott Brothers (London), Ltd.), 52
— Measurement and Control Chart, 67*. See *Addendum*, 275
— Recorder (Negretti & Zambra), 166*
Tempering. See *Heat Treatment* under *Metallurgy*
Temple, F. C., on Jamshedpur Sewage Pumping Stations, 417
Tenders, 44, 100, 130, 188, 218, 350, 304, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704
— Locomotive. See *Locomotive*
Tensile Tests. See *Tests (Materials)*
Teredo, Timber Destruction by, 187, 217
Ternary Alloys. See *Alloys* under *Metallurgy*
Terolas, Road-Surfacing Material, 659

Tests (Materials):
Alternating-Stress Testing Machine (A. J. Amsler & Co.), 432*
— — Tests of Aircraft Materials, 542
— — Tests, Aluminium Alloys at Elevated Temperatures, 327, 342*
— — Tests, Cast Iron, 238. See LETTERS, 299, 459
Anvil Effect in Hardness Testing of Thin Strip, 364, 367
Bending Test for Determining Hardness of Thin Strip, 364
— — Heat-Treated Stainless Steels, 689*
Compression Tests, Cured Concrete, 659
Hardness Testing Machine, 125-kg. (T. C. Howden & Co.), 505*
— — of Thin Copper and Brass Strips, 364, 367*
— Tests, Cold-Rolled Zinc, 326
— — Diamond-Pyramid, for Thin Materials, 364, 367*
— — Steels for Internal-Combustion Engine Valves, 57
Impact Tests, Izod, Value of, 489, 496
— — Steels for Internal-Combustion Engine Valves, 57, 84*
Materials, Strength of (Review), 373
Mechanical Tests for Steel Wire, 609
Notched-Bar Impact Tests. See *Impact Tests* (above)
Stresses in Materials and Structures. See *Stress*
Tensile Tests, Chromador High-Tensile Steel, 275
— — of Lead Alloys, Interpretation of, 311, 314*
— — Steel for Internal-Combustion Engine Valves, 56, 83*
— — Tellurium-Lead, 317*
Testing Apparatus, Static and Dynamic (A. J. Amsler & Co.), 432*
— Laboratory, Cambridge University Engineering Department, 118*
— — Westminster Technical Institute, 226*
— — Machine, Alternating Stress, for Wire, 567*
— — Compression, 500-ton Self-Indicating (W. & T. Avery, Ltd.), 176*
— — 125-kg. Hardness (T. C. Howden & Co.), 505*
— — 60,000-lb. Universal (Tinius Olsen Testing Machine Co.), 194*
Test Rooms, Acoustics Laboratory, Metropolitan-Vickers Electrical Co., Ltd., 564*
— Aeronautical. See *Aeronautics*
— of Aeroplane Engines, Report, 76
— of Axial-Flow Pump, 38*
Test, Corrosion. See *Corrosion*
— of Earth Resistance of Power Transmission Towers, 145*. See *Addendum*, 250
— of Experimental Babcock & Wilcox Boiler, 334
— Explosion-Pot Circuit Breakers, 8*, 47. See LETTERS, 216, 259, 275, 364, 578
— of G.G.G. Self-Priming Pump, 471*
— Knock-Rating, of Motor Fuels, 465
— of Liquid-Oxygen Explosives, 18
— 5,000-s.h.p. Marine Oil Engine, 258*
— 300-h.p. Petrol Locomotives, 677
— Pulverised-Fuel Fired Lancashire Boiler, 243
— 7-h.p. Single-Cylinder Two-Stroke Oil Engine, 312*. See *Addendum*, 331
— 260-b.h.p. Six-Cylinder Brotherhood-Ricardo Diesel Engine, 595*
— of 120-h.p. Six-Cylinder Oil Engine (Tangyes, Ltd.), 204*
— of Refractories for Boiler Furnaces, 4*, 34*
— Starting, of Motor Fuels, 300*, 374*. See *Errata*, 430
— on "Swell" of Water in Boilers, 672*
— Vibration Frequency, 67,200-kW Steam-Turbine Discs, 585*
— of Zinc Coatings on Galvanised Wire, Specification, 175
Testing Apparatus, Static and Dynamic (A. J. Amsler & Co.), 432*
— Equipment, Electrical, for Motor-Car Engines (Humber-Hillman Motor Car Co., Ltd.), 421*
— Laboratory, Cambridge University Engineering Department, 118*
— — Westminster Technical Institute, 226*
— — See also *National Physical*
— Machine, Alternating Stress, for Wire, 567*
— — Compression, 500-ton Self-Indicating (W. & T. Avery, Ltd.), 176
— — 125-kg. Hardness (T. C. Howden & Co.), 505*
— — 60,000-lb. Universal (Tinius Olsen Testing Machine Co.), 194*
— for Woodworking Research, 27*
— — See also *Tests (Materials)*
— Radiographic, of Engineering Structures, 335, 340*
— Set, Portable, for Polyphase Meters (Chamberlain & Hookham, Ltd.), 59
— of Welded Work, 328*, 420, 442
— See also *Tests (Materials); Trials*
Tetrachlorides, Volatile, Influence on Magnesium and Copper, 363, 675
Text Books. See LITERATURE INDEX
Textile-Machinery Industry, Position and Prospects, 224
"Thames," H.M. Submarine, 10,000-s.h.p. Oil Engines, 258*
— River, Cable Tunnel, Battersea Power Station, 153
— — Overhead Power Transmission Lines, Earth Resistance of Towers, 145*. See *Addendum*, 250
— — Reconditioning of Waterloo Bridge, 165
— — Tidal Floods on, 255
Theodolites, Early, at Ashmolean Museum, Oxford, 535*
Thermal Efficiency of Gas-Fired Boiler, 515
— — of Marine Boilers with Furnace Water-Walls, 13
— — of Naval Water-Tube Boilers, 483
— — Thornhill Power Station, 659
— Insulating Materials, Properties of, 536
— Maximum-Demand Indicator (Crompton Parkinson, Ltd.), 94*
— Treatment, Metals. See *Heat Treatment* under *Metallurgy*
Thermionic Valves. See *Valves; Telephony, Wireless; Telegraphy, Wireless*
Thermo-Magnetic Cycle, Application to Hardening of Steels, 67*. See *Addendum*, 275
Thermo-Technical Institute, Moscow, Super-Pressure Turbine, 283. See *Erratum*, 330
Thermodynamics, International Steam Tables, 707
— Theory of Velox Boiler, 52*, 107, 186*, 259
Thermograph, Dial (Cambridge Instrument Co., Ltd.), 245*
Thermometers, Industrial, Table of, 67*. See *Addendum*, 275
— Royal Society, 566
— See also *Pyrometer*
Thiel, Gebr., G.m.b.H., Metal Band-Saw, 453*
Thomas, S. G., Invention of Basic Steel Process, 171
Thompson, J. (Wolverhampton), Ltd., Welded Drums, 215
Thornhill Power Station, Operating Results, 659
Thornton, A. G., Compound-Interest Slide Rule, 277
Thornton, Sir H., the late, 332
Thornycroft, J. I., & Co., Ltd., H.M. Destroyer "Decoy," 100
Thorpe, W. H., on Marquis of Worcester at Vauxhall, 292
Thredolets Pipe Fittings, 70
Threshing Machine, A.E.G.-Segler, Motor-Driven, 671*
Throttle Valve. See *Valve*
Thrust Bearing. See *Bearing*
— of Propellers. See *Propellers; Aeronautics*
Thrustors, Electro-Hydraulic (British Thomson-Houston Co., Ltd.), 24
Tidal Floods on River Thames, 255
— Power, Severn Barrage Scheme, Report, 307, 394*, 599
Tideswell, Dr. F. V., on Constitution of Coal, 610
Tiles, Chequer, Multi-Hole, for Hot-Blast Stoves, 502*
Tilting Gear, Hydraulic, for 650-ton Marine Turntable Slipway, 561*
Timber Destruction by Marine Borers, 104, 187, 217. See 708
— Deterioration in Sea Water, Report, 708
— Empire, Conference on, 105
— — Investigations on, 637
— Estate and Farm, Preservative Treatment, 433
— Researches on Working of, 27*
— Seasoning, Investigations, 637
Time Interval Counting Apparatus, 602

Tin Alloys. See *Alloys* under *Metallurgy*
— and Tinplate Prices. See *Metal-Price Diagrams*
Tinius Olsen Testing Machine Co., 60,000-lb. Universal Testing Machine, 194*
Tipplers, Wagon, New Blackburn Meadows Power Station, 456*
Titanium Tetrachloride, Influence on Magnesium and Copper, 363, 675
Titicaca Lake, Bolivia, Motor Boat for, 15
Todd, Dr. F. H., on Propeller Experiments and Models of Coasters, 468
Tollemache, H., & Co., Ltd., Marketing Scheme for Pulverised Fuel, 703
Tomato Culture, Soil Heating by Electricity, 92
Tonnage Measurement of Ships, 415, 441
Tool Dynamometer (Schiess-Defries A.-G.), 294
— Grinder. See *Grinding* under *Machine Tools*
— Machine. See *Machine Tools*
— Steel. See *Steel*
Tootal, Broadhurst, Lee & Co.'s Showroom, Heating and Ventilating System, 434
Toothed Gear. See *Gear; Gearing; Marine Propulsion*
Torbagy Substation, Hungarian State Railways, 58*
Torpedo Boats and Destroyers. See *Warships*
Tosi Steam Turbine, Use in Warships, 322
Toulon Arsenal, Missiessl Power Station, Use of ATV Steel Turbine Blading, 289
Towers, Cooling, Natural-Draught, New Blackburn Meadows Power Station, 702*
— Marine, for Grain Handling, 144*, 200*
— Slurry, and Washery, Coke-Oven and Recovery Plant, Iriam, 539*
— Transmission, and Earth Resistance, 145*. See *Addendum*, 250
— Water, Ferro-Concrete, Chester Waterworks, 577*
Town Gas. See *Gas*
— Planning, Advances in (Review), 372
Townend, Dr. H. C. H., Apparatus for Observing Turbulence in Airflow in Pipe, 602
Traction, Electric. See *Railways; Tramways*
— Engines, Steam, Development of, 639* See LETTER, 687
Tractor, Detachable, for Road Vehicles (Scammell Lorries, Ltd.), 633*
— Roadless, Oil-Driven (Marshall, Sons & Co., Ltd.), 700*
Trade Agreements and British Manufacturers, 633
— Agricultural Machinery, Imports and Exports, 361
— — Machinery, Position in, 698
— British, with Russia, 361, 385, 467. See LETTER, 416
— Co-operative Selling in Overseas Markets, 135
— Copper Imports of, 92
— Disputes. See *Labour; Labour Notes*
— Economic Conditions in Brazil, Report, 600
— — Conditions in Chile, Report, 466
— — Conditions in East Africa, Report, 584
— — Conditions in Ecuador, Report, 466
— — Conditions in Italy, Report 174, 192
— — Conditions in Nyasaland, Report, 584
— — Conditions in Philippine Islands, Report, 637
— — Conditions in Portuguese East Africa, Report, 674
— — Conditions in Rhodesia, Report, 584
— Electrical Machinery, Imports and Exports, 92
— Engineering and Allied, Position and Prospects, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
— Exhibition. See *Exhibition*
— Locomotive, Imports and Exports, 309
— Machine-Tool, Import Duties, 187; Imports and Exports, 268
— Machinery, Imports and Exports, 20, 92, 150, 181, 224, 268, 309, 361, 413, 443
— Marine-Engine, British Exports, 413
— Mercantile Shipping Crisis, Report, 600. See LETTER, 687
— Motor Cycles and Cycles, Imports and Exports, 150
— — Vehicles, Imports and Exports, 181
— Overseas Exhibition Ship Scheme, 334
— Shipping Industry, Position of, 222. See 600, 687
— Steel-Sheet, Position of, 525
— Textile Machinery, Imports and Exports, 224
— Unions. See *Labour; Labour Notes*
— World, and Engineering Progress, 282
Trafalgar Square, London, Electro-Matic System of Traffic Control in, 388*. See 596
Traffic Bill, Road and Rail, 438
— Control, Electro-Matic System, Trafalgar Square, London, 388*. See 596
— — System, Piccadilly, London, 596. See 388*
— Passenger and Freight, on British Railways, 574
— — Paris Metropolitan Railway, 429*
— Problem and Coastal Shipping, 467
Train, Express, "Royal Scot," at Chicago World's Fair, 558
— See also *Railway*
Training. See *Education*
Tramway Cars, Use of Aluminium in, 628
— See also PARAGRAPH INDEX
Transformation Points, Metals. See *Metallurgy*
Transformers, 66-kV, Battersea Power Station, 152
— Current (Harland Engineering Co., Ltd.), 275*
— Miniature Current (Ferranti, Ltd.), 95*
— Multiversal Current (Elliott Brothers (London), Ltd.), 51*
— 4,000-kVA. Single-Phase, Hungarian State Railways, 58*
— 1,750-kVA, Sivasamudram Hydro-Electric Scheme, 3*
— and Switch, 5-kVA, Combined (English Electric Co., Ltd.), 274*
— Treatise on (Review), 64
— Welding, Polyare (Murex Welding Processes, Ltd.), 275*
Transmission Gear. See *Gear; Gearing; Marine Propulsion*
— of Power. See *Marine Propulsion; Power Transmission*
Transmutations, Atomic, 348
Transport Board, London Passenger, Appointment of, 575
— in Clay Industries, Cost of, 610
— Conference, Rail and Road, Replies to Criticisms, 49. See LETTER 81
Transport Engineering, Ltd., Load-Discharging Floor for Lorries, 247
— of Grain in Canada, 141*, 199*
— Institute of, Transportation in Austria, by F. Strauss, 232
— Mineral, Railway Wagons for, 495
— Motor. See *Road; Motor*
— Railway. See *Railway*
— Road. See *Road; Motor*
Transportation in Austria, 232
Transporters, Agricultural, German, Improvements in, 670*
— Crane, New Blackburn Meadows Power Station, 456*
Transverse Tests. See *Tests (Materials)*
Trap, Steam. See *Steam Trap*
Trapezoidal Mass Concrete Retaining Walls, 644*
Travelling Crane. See *Crane*
Tree Stump Puller, P. & H. (Harnischfeger Corporation), 475*
Trevithick, Centenary of, 106, 408, 439*, 459, 467
Trevithick's Exhibition Railway, London, 1808, 693*
Trevithick Memorial at Merthyr Tydfil, Proposed, 463
Trevithick, R. L., the Late, 197
Trewhella Brothers Proprietary, Ltd., Monkey Wire Strainer, 700*
Trials of Naval Water-Tube Boilers, 483
— Pulverised-Fuel, S.S. "Nagoya Maru" and S.S. "Johore Maru," 377*
— of 2,500-b.h.p. Six-Cylinder Fullagar-Diesel Engine, 604*
— See also *Tests*
Trieste, 150-ton Floating Crane for, 177*
Trip Gear, Vacuum Emergency, 67,200-kW. Steam Turbine, 667*
Triplex Safety Glass Co., Ltd., Manufacture of Safety Glass, 173
Tronstad, Dr. J., on Sulphur and Phosphorus and Corrosion of Iron, 590
Trucks, Railway. See *Wagons*
Tube Brushing and Burnishing Machine (F. Gilman (B.S.T.), Ltd.), 210*
— Railways. See *Underground Railways*
— Wells, Southampton Graving Dock, 697
— See also *Pipes*
Tubing, Copper, Arsenical, Fabrication and Properties of, 665
Tummel Bridge Hydro-Electric Plant, 24,000-h.p. Turbines, 511*
Tungsten Lamps. See *Lamps* under *Electric*
Tuning Fork for Acoustical Researches, 565
Tunnel, Cable, Battersea Power Station, 153
— Circulating-Water, Ford Motor Works, Dagenham, 169
— Construction, Paris Metropolitan Railway, 61*, 122*, 319*, 371*
— Loch Ericht Hydro-Electric Scheme, 608
— Lochaber Hydro-Electric Scheme, 628, 635
— River Hooghly, 41
— Washing Machine, Paris Metropolitan Railway, 429*
Turbine, Exhaust Steam, for Condensing Locomotive, 517*
Turbine Gears, Ltd., Axien Flexible Coupling, 247*
— Hydraulic, Alluvial-Matter Eliminators for Water Supply to, 480
— — 24,000-h.p. Double-Runner, Tummel Bridge Power Plant, 511*
— — Flow in (Review), 669
— — 22,000-h.p., Francis, Loch Ericht Hydro-Electric Scheme, 608
— — 5,600-h.p. and 9,000-h.p. Francis, Sivasamudram Hydro-Electric Scheme, 1*
— — 6,600-kW. Pelton Wheel, Lochaber Hydro-Electric Scheme, 635
— — Primitive Forms of, 292
— — Severn Barrage Scheme, 307, 394, 599
— — See also *Power Plant*
— Pumps. See *Pumps, Centrifugal*
— Steam, ATV Steel Blading for, 289*
— — 67,200-kW. Battersea Power Station, 585*, 667*
— — 80,000-kVA, Battersea Power Station, 91*
— — De Laval, First in United States, 713*
— — 50,000-kW, Dunston Power Station, 156*
— — 12,000-s.h.p., Geared, Marine, S.S. "Santa Rosa," 112
— — Mechanical Breakdowns of, 489, 662
— — 25,000-kW, New Blackburn Meadows Power Station, 701*
— — 100,000-h.p. Parsons Type, S.S. "Conte di Savoia," 423*
— — in Russian Power Stations, 476. See 283, 330
— — 24,000-kW Super-Pressure, Moscow Power Station, 283. See *Erratum*, 330
— — See also *Turbo-Generators*
— Steamers. See *Steamers; Warships*
— Vapour (Cochrane Corporation), 140*
Turbo-Generators, 67,200-kW, Battersea Power Station, 585*, 667*
— — 80,000-kVA, Battersea Power Station, 91*
— — 850-kW, "Conte di Savoia," 426*
— — De Laval, First in United States, 713*
— — Mechanical Breakdowns of, 662
— — 25,000-kW, New Blackburn Meadows Power Station, 701*
— — 50,000-kW, Dunston Power Station, 156*
— — in Russian Power Stations, 476. See 283, 330
— — for Ship Propulsion, Control of, 236
Turbulence in Airflow in Pipe, Apparatus for Observing, 602
Turner, S., on Position of World Mineral Industry, 664
Turner, Prof. W. E. S., on Glass Industry in Europe, 463
Turning and Boring Mills. See *Machine Tools*
— See *Machine Tools*
Turntable Slipway, Marine, 650-ton, at Lorient, 559*, 629*
Turret Lathes. See *Lathes* under *Machine Tools*
Tuscany, Steam Springs of, Industrial Application of, 522
Twist Drill Grinder. See *Grinding Machine* under *Machine Tools*
Tyres, Motor Car, Standardisation of, 709

U.

"UCKERMARK," S.S., Benson Boilers, 112, 682
Ugine Steel Works, Researches on Dephosphorisation and Deoxidation of Steel at, 488, 674. See 171
Uhl River Hydro-Electric Scheme, Punjab, Opening of, 308
Underground Railways, London, Improvements in Station Lighting, 675; Rolling Stock, 226
— — Paris, Development, 61*, 122*, 319*, 371*, 428*
— Support, Yieldable Metal Props for, 665
Unemployment. See *Labour*
Union Cartage Co., Ltd., *versus* Donovan, 626
— Trade. See *Labour; Labour Notes*
United Kingdom, Wheat Statistics for, 201*
— States, Blast-Furnace Design and Practice in, 501*, 541
— — Bureau of Mines, Report on Liquid-Oxygen Explosives, 18; Report on Ignition of Fire Damp by Explosives, 110
— — Coal in, Competitive Position of (Review), 642
— — Coal and Petroleum in, Competitive Relation between, 642, 664
— — Co-operative Fuel Research Committee, Investigations of Motor Fuels, 465
— — Diablo Hydro-Electric Power Station, 300-ton Overhead Travelling Crane, 416*
— — Early Bridges in, 389
— — First De Laval Steam Turbine, 713*
— — Geological Survey, Report on Nitrate Deposits, 21
— — Municipal Finance in, Report, 105
— — Navy. See *United States* under *Warships*
— — Nitrate Deposits in, Report, 21
— — Oil Production in, 664
— — Position of Mineral Industry in, 664
— — Sewage Treatment in, 163
— — Unemployment Problem in, 103, 221. See LETTER, 170
— — See also *America*
United Steel Companies, Ltd., Exhibits at British Industries Fair, 271. See *Erratum*, 304
— Steel Works, Germany, Tests of Welded Steel Drums, 328*
University, Birmingham, Civil Engineering Department, 100-ton Compression Testing Machine, 176*
— of Bristol, Experiments on Vacuum Production by Air Ejectors, 230*, 262*. See 255*
— Cambridge, Engineering Department, Extensions, 117*
— of London, New Headquarters, Bloomsbury, 709
— of Michigan, Tank Experiments on Local Hollowing Forward, 469
— See also *Education*
Unwin, C. B., on Electric Trains for Stopping Services, 226
Unwin, Dr. W. C., the Late, 336*
Urquhart's (1926), Ltd., Oil-Fired Melting Furnace, 186
"Ursus," 150-ton Floating Crane, 177*
Usco Type Air-Heaters, New Blackburn Meadows Power Station, 457

V.

VACUUM Augmenter, Invention of, 230
— Cleaner, Portable (Spencer Turbine Co.), 39*
— Emergency Trip Gear, 67,200-kW Steam Turbine, 667*
— Pan for Glucose Manufacture, 390*
— Production by Air Ejectors, Experiments on, 230,* 255*, 262*
— Pump. See *Pump*
Valenciennes-Anzin Power Co., Feed-Water Distillation System, 116*
Valentine, A. S., on Grampian Hydro-Electric Scheme, 607
Valmax Valve Steel, 271. See *Erratum*, 304
Valve-Box Casting, Steel (Hadfields, Ltd.), 638*. See 557, 589
— Bubbling (Metropolitan-Vickers Electrical Co., Ltd.), 602
— Butterfly, Automatic, Sivasamudram Hydro-Electric Scheme, 2*
— Emergency and Stop, 67,200-kW Steam Turbine, 667*
— Exhaust, Internal-Combustion Engine, Failures, 580*, 615
— Heat-Motor (Drayton Regulator and Instrument Co., Ltd.), 50*
— Inlet, Butterfly Type, Tummel Bridge Hydro-Electric Plant, 513*
— Internal-Combustion Engine, Steels for, 55*, 83*
— 18-in. Plug (Walworth Co.), 138*
— Regulating, Feed-Water, Three-Element Control, 672*
— — Pilot-Controlled (Cochrane Corporation), 139*
— Sodium-Cooled, for Internal-Combustion Engine, 56*
— Thermionic, 500-kW Cooled-Anode (M.O. Valve Co., Ltd.), 167*
— — See also *Telegraphy, Wireless; Telephony Wireless*
Vanick, J. S., Nickel-Chromium Cast Irons, 665
Variable-Speed Gear. See *Gear*
Vaughan, W. H., the Late, 11
Vauxhall, Experiments of Marquis of Worcester at, 292
Velox Boiler, Theory of, 52*, 107, 186*, 259
Ventilating and Heating System, Tootal, Broadhurst, Lee & Co.'s Showroom, 434
Ventilation and Atmospheric Pollution, 493
Vernon, Dr. H. M., on Estimation of Solar Radiation, 637
"Vespasian," S.S., Geared Turbines of, 322
Veyers, E. G., Winning and Transport of Clay, 610
Vibration Frequency Tests, 67,200-kW Steam-Turbine Discs, 585
— in Ships, Method of Minimising, 445* 485
Vice. See *Machine Tools*
Vickers-Armstrongs Ltd., H.M. Submarine "Thames," 258*
Victoria, Australia, Wonthaggi Colliery, 102
Vienna Meeting of International Chamber of Commerce, Report on Mercantile Shipping Crisis, 600. See LETTER, 687
Vilvorde, Pont Brûlé Coke-Oven Plant, 618
Vokes, C. G., Ltd., Air Filter, 244*
Vulcaniser, Steam-Heated, Explosion of, 621

W.

WADDELL, Dr. J. A. L., on Open-Mesh Bridge Decking, 636*
Wages. See *Labour*
Wagner, G., Rail-Sawing and Drilling Machine, 453*
Wagons, Railway, for Grain Transport, 141*
— — Suggested Improvements, 495
— Steam, Boiler Explosion in, 234
Wakefield, Ryburn Dam and Reservoir, 692
Wakley, W. J., Electro-Pneumatic Control Gear for Petrol Locomotives, 676*
Waldrich, H. A., G.m.b.H., High-Speed Lathe, 294*
Walker, J., on Refractories in Boiler Furnaces, 4*, 34*
Walker, J. H., Model Ferro-Concrete Slabs, 686
Walker, S., the Late, 197
Walls, Concrete, Southampton Graving Dock, 697*
— Furnace, Refractories for, 35
— Quay, Southampton Dock Extensions, 611*
— Retaining, Concrete, Minimum-Section Trapezoidal, 644*
Wallsend Slipway & Engineering Co., Ltd., Oil-Fuel Burners, 212*
Walworth Co., 18-in. Plug Valve, 138*
Wanderer-Werke, A.-G., High-Duty Milling Machine, 451*
Ward, H. W., & Co., Ltd., 28-in. Combination Turret Lathe, 551*; Hexagon Turret Lathe for Bar Work, 551*
Ward, J. C., the Late, 216
Ward Leonard Electric Co., 1 to 25,000-ohm Rheostats, 196
Warming Effect of Solar Radiation, 637
Warren, Lieut.-Col. P. R., the Late, 365

Warships:

French Navy, Use of Turbines in, 322
German Battleship "Prinz Regent Luitpold," Salvage of, 545
H.M. Destroyer "Decoy," 100
— Navy, Estimated Expenditure, 1933-34, 437
— — History of Engineering Branch, 561, 657
— — Selborne-Fisher Scheme of Training, 657
— Ship "Bristol" 22,000-s.h.p. Brown-Curtis Turbines, 322
— — Introduction of Geared Turbines, 322
— — Oil from Coal for, 193
— Submarine "Thames" 10,000-s.h.p. Oil Engines, 258*
Naval Engineering History, 321, 561, 657
— and Shipping Annual, Brassey's (Review), 601
Portuguese Navy, Destroyers for, 652
— — Sloops for, 704; Trials of Sloop "Gonçalo Velho," 108
Submarine Hulls, Design of, 484
United States Navy, Introduction of Electric Transmission, 323
— — Navy, Use of Turbines in, 322
Warship Construction, Electric Welding in, 419*, 442
See also *Naval* in PARAGRAPH INDEX
Wash-Oil Still, Coke-Oven and Recovery Plant, Iriam, 540*
Washer, Motor Car (Laycock Engineering Co.), 396*
— — Car, Two-Hose (B.E.N. Patents, Ltd.), 328*
Washery and Slurry Tower, Coke-Oven and Recovery Plant, Iriam, 539*
Washford Cross, Minehead, West Regional Broadcasting Station, 542*
Washing Machine, Tunnel, Paris Metropolitan Railway, 429*
Washington, Diablo Hydro-Electric Power Station, 300-ton Overhead Crane, 416*
Water, Drinking, Action of Lead Pipes on, 386
— Engineers, Institution of, Southend-on-Sea Meeting, Programme, 422; Presidential Address, by J. R. Fox, on Progress of Water Supply, 691; Features of Construction on Ryburn Dam, by J. N. Wood, 692; Chelmer and Blackwater Supplies of Southend Waterworks Co. (*a*) Description of Works, by T. E. Hawksley, W. S. Nicholson and E. C. Bilham, (*b*) Softening and Sterilisation of River Waters by Excess Lime Process, by Dr. J. F. Beale, Dr. E. Suckling, R. G. Pelly and G. W. Houghton, 692, 711; Stour Scheme of South Essex Waterworks Co., by B. W. Bryan, 711
— Gauge, Bi-Colour (Dewrance & Co.), 602*
— Level Indicator, Distant (Evershed & Vignoles, Ltd.), 77*
— Mains, Types of, 691
— Mixer (Fulton-Syiphon Co.), 138*
— Pollution Research Board, Report, 386
— Power. See *Hydraulic; Power Plant; Power, Water; Turbine, Hydraulic*
— Purification by Carbon, 711
— — by Excess Lime Process, 692, 711

Water Softener, Automatic Zeolite (Permutit Co.), 195*
— Supply, Progress of, 691
— — from Rivers, Purification by Excess Lime Process, 692, 711
— — from River Stour, 711
— — See also *Irrigation*; *Wells*
— Tower, Ferro-Concrete, Chester Waterworks, 577*
— Tube Boiler. See *Boiler*
— Turbines. See *Turbines, Hydraulic*; *Power Plant*
Waterloo Bridge, Reconditioning of, 165
Waterworks, Chester, Boughton Reservoir, 576*
— Southend, Chelmer and Blackwater Schemes, 692, 711
— See also *Water Supply* and PARAGRAPH INDEX
Watford By-Pass Road, Lighting of, 679
— Luton Power Transmission Towers, Earth Resistance of, 145*. See *Addendum*, 250
— Road, Wembley, Lighting by Hot-Cathode Tube Lamps, 360*
Watson, F. R. B., on Production of Vacuum by Air Ejector, 230*, 262*. See 255*
Watson, G. O., on Electric Ship-Propulsion Systems and Control, 236
Watt Memorial Institute, Birmingham, 254, 548
Waves and Electrons (Review), 123
— Propagation by Explosions, Study of, 110
Weaver, F. D., on Low Melting-Point Metals and Alloys, 311
Wee-Mac Portable Pumping Set (Drysdale & Co., Ltd.), 700*
— — Self-Priming Pump (Drysdale & Co., Ltd.), 302*
Weigher, Continuous, for Belt Conveyors (Merrick Scale Manufacturing Co.), 70*
Weighing Machine, Grain, 12,000-lb. Automatic (W. & T. Avery, Ltd.), 568*. See 136, 141*, 199*
— — for Granaries, 137, 143, 568*
Weir, Diversion, Sivasamudram Hydro-Electric Scheme, 1*
— Outlet, Boughton Reservoir, Chester Waterworks, 577*
Weld Decay in Austenitic Stainless Steels, 689*
Welded Pipe Fittings (Bonney Forge and Tool Works), 70
— — Fittings (Midwest Piping & Supply Co., Inc.), 70
— Sheet-Steel Roof, Self-Supporting, Albany, New York, 22*
— Steel Drums, Testing of, 328*
— Structures, Radiographic Examination of, 335, 340*
Welders, Training and Supervision of, 420, 442
Welding Company (J. K.), Self-Supporting Arc-Welded Steel Roof, 22*
— Electric Arc, Manual of (Review), 295
Welding, Electric, Factory Building, North Acton, 444
— — in Ship Construction, 111, 359, 419*, 442
— of Engineering Structures, 447
— Installation, Oxy-Acetylene, Chiswick Works, London General Omnibus Co., 353*
— for Longitudinal Seams of Ships, 111
— Machines, Spot (Allgemeine Elektricitäts Gesellschaft), 504*
— Process, Shielded-Arc (Lincoln Electric Co.), 688*
— Research by Institution of Mechanical Engineers, 277
— — 277, 448
— Resistance, Thermionic-Valve Controller for (Cutler-Hammer, Inc.), 195*
— Symbols, German, 479*
Weldoleta Pipe Fittings, 70
Welin Davits, S.S. "Conte di Savoia," 606*
Wellington, New Zealand, Design of Dominion Museum, 478
Wells, Steam, Tuscany, Utilisation of, 522
— Tube, Southampton Graving Dock, 697
Wembley, Watford Road, Lighting by Hot-Cathode Tube Lamps, 360*
Wemyss, Lord Wester, the Late, 503
Wentworth-Sheilds, F. E., Southampton Dock Extensions, 611*, 696*
Werner, F., A.-G., Milling Machine, 403*; Gear-Lapping Machine, 452*
West, A., & Co., Ltd., Feed-Water Regulator, 672*
West, F., on Winning and Transport of Raw Materials in Clay Industry, 610
West Regional Broadcasting Station, 542*
Wester Wemyss, Lord, the Late, 503
Westinghouse Brake and Saxby Signal Co., Ltd., Metal Rectifiers, 169
Westley, Williams & Co., Foundations for 80,000-ton Granary, 148*
Westminster Technical Institute, Extension of, 226*
Weyman, J. E., the late, 623
Wharf, Coke, Coke-Oven and Recovery Plant, Iriam, 540*
— Ferro-Concrete, Battersea Power Station, 80*
— Piles, Sydney, Destruction by Marine Organisms, 104
Whayman, Engr.-Rear-Admiral W. M., on Water-Tube Boilers for Cargo Ships, 333. See *Erratum*, 382. See LETTER, 389
Wheat, Handling and Storing of, 136, 141*, 199*, 568*
— Statistics for United Kingdom, 201*
Wheeler, Prof. R. V., on Coke Consumption in Blast Furnaces, 531*. See 525
Wheels, Gear. See *Gears*; *Gearing*; *Marine Propulsion*
— Railway, Solid-Rolled, Specification, 544
Whipple, R. S., Exhibits at Royal Society Conversazione, 566
White, J. E., on Gas as Industrial Fuel, 619
— Metal. See *Alloys* under *Metallurgy*
Whitehead, H. C., on Sewage Disposal in Great Britain, 163
Whitworth Society, Summer Meeting, Nottingham, 709
Widia Tools for Machine Tools, 293, 400
Wigmore, V. S., on Reduction of Concrete Costs, 19
Wild-Barfield Electric Furnaces, Ltd., Electric Furnace with Forced-Air Circulation, 97; Telcon Resistance Materials, 97; Electric Furnaces, 248
Williams, A. E., on Glucose Industry, 237*, 397*
Wills Pressure Filled Joint Ring, Ltd., Joint Rings, 213
Wilson, E. A., the late, 513
Wilson, E. B., & Co., Early Steam Traction Engine, 639
Wilson-Drewry Gear Boxes for Petrol Locomotives, 676*
Wilton Drier, Coke-Oven and Recovery Plant, Iriam, 540*
Winch Gear for Radial Transporter, New Blackburn Meadows Power Station, 457*
Wind Direction in British Isles Since 1341, 652
— Effect on Ship Performance, 467
— Structure over Different Surfaces, 652
— Tunnels. See *Aeronautics*
Winding Engines, Deceleration Governor for (Metropolitan-Vickers Electrical Co., Ltd.), 114*
Windlasses, 150-ton Floating Crane, 177*
Winget, Ltd., Brick-Breaking Machine, 213*
Wire, Aluminium, Electrical Conductivity of, 327, 473*
— Copper, Enamelled, Specification, 650
— Drawing Machine, Immersed-Die (Sir J. F. Norton & Co., Ltd.), 208*
— Galvanised, Tests of Zinc Coatings on, Specification, 175
— Meshing, Woven (G. A. Harvey & Co. (London), Ltd.), 246*
— Ropes, Alternating-Stress Testing Machine for (A. J. Amsler & Co.), 432*
— Steel, Drawing, 608*
— — Researches on, 447
— Strainer, Monkey (Trewhella Brothers Proprietary, Ltd.), 700*
Wireless Telegraphy. See *Telegraphy*
— Telephony. See *Telephony*
Witton Works, Higgs Motors, 710*
Wöhler's Tests. See *Alternating Stress* under *Tests* (*Materials*)
Wonthaggi Colliery, Victoria, Australia, 102
Wood, J. N., on Construction of Ryburn Dam, 692
Wood-Preserving Association, British, Investigations on Preservation of Estate and Farm Timber, 433
Woodall-Duckham Vertical Retort and Oven Construction Co. (1920), Ltd., Coke-Oven and Recovery Plant, Iriam, 539*
Wooden Flooring, Investigation of Decay, 637
Woodeson Pulverised-Fuel Burners, S.S. "Nagoya Maru," 378*
Woodworking Machinery. See *Machine Tools*
Woolf, A., Life and Work of, 109
Woolwich Research Department, Radiological Researches at, 335, 340*; Investigations on Steel Castings, 557, 589, 638*
Worcester, Marquis of, Experiments at Vauxhall, 292
Workmen's Compensation. See *Labour*
— See *Labour*

Works:

Higgs Motors, Witton Works, 710*
Works Management, Training the Engineer for, 75. See LETTERS, 129, 170
Workshops. See also *Works*; *Machine Tools*
World Economic Conference, Opening of, 654
— Oil Reserves, Estimates of, 664
— Petroleum Congress, London, 197, 391, 540
Wormald, Sir J., the Late, 578
Wotan-Zimmermann-Werke, Hydraulically-Operated Shaping Machine, 400*
Writing-Projection Apparatus, Belsazar (C. Zeiss (London), Ltd.), 78
Wrought Iron. See *Iron*

Y.

YARROW & Co., Ltd., Destroyers for Portuguese Navy, 652
Year Books. See LITERATURE INDEX
Yorkshire Electric Power Co., Ltd., Thornhill Power Station, Operating Results, 659
Youngleson, E. L., Ltd., Noveto Bench Vice, 527*

Z.

ZEISS, C. (London), Ltd., Belsazar Writing Projection Apparatus, 78; Sodium Vapour Lamp, 79
Zinc Alloys. See *Alloys* under *Metallurgy*
— Coatings on Wire, Tests of, 175
— Cold Rolling of, 326
— Prices. See *Metal-Price Diagrams*
Zoelly Steam Turbine, Use in Warships, 322
Zuyder Zee Reclamation, 309

ONE-PAGE AND TWO-PAGE PLATES.

PLATE

I. Sivasamudram Hydro-Electric Power Scheme, Mysore (between pages 2 and 3)

II. Lathe, Heavy, 1·8-metre Centre Electrically-Operated (between pages 38 and 39)

III. Temperature-Measuring Instruments, Table of (between pages 68 and 69)

IV. Battersea Generating Station, London Power Company (between pages 90 and 91)

V. Engineering Laboratories, Cambridge University (between pages 118 and 119)

VI. Granary, 80,000-ton, Bahia Blanca, Argentina (facing page 148)

VII. Granary, 80,000-ton, Bahia Blanca, Argentina (between pages 148 and 149)

VIII. Granary, 80,000-ton, Bahia Blanca, Argentina (facing page 149)

IX. Crane, 150-ton Floating, at Trieste (between pages 178 and 179)

X. British Industries Fair, Exhibits at (facing page 208)

XI. British Industries Fair, Exhibits at (facing page 209)

PLATE

XII. British Industries Fair, Exhibits at (facing page 212)

XIII. British Industries Fair, Exhibits at (facing page 213)

XIV. British Industries Fair, Exhibits at (facing page 240)

XV. British Industries Fair, Exhibits at (facing page 241)

XVI. British Industries Fair, Exhibits at (facing page 248)

XVII. British Industries Fair, Exhibits at (facing page 249)

XIX. Granary, 80,000-ton, Bahia Blanca, Argentina (between pages 266 and 267)

XX. Leipzig Fair, Machine Tool Exhibits at (between pages 294 and 295)

XXI. Leipzig Fair, Machine Tool Exhibits at (facing page 325)

XXII. Radium in Engineering Practice (facing page 341)

PLATE

XXIII. "Conte di Savoia," Quadruple-Screw Liner (between pages 346 and 347)

XXIV. Switchgear, Compressed Air-Operated, New Blackburn Meadows Power Station, Sheffield (facing page 378)

XXV. Switchgear, Compressed Air-Operated, New Blackburn Meadows Power Station, Sheffield (between pages 378 and 379)

XXVI. Switchgear, Compressed Air-Operated, New Blackburn Meadows Power Station, Sheffield (facing page 379)

XXVII. Bucket Dredger Excavator, 1·44-cubic yard Overburden (between pages 406 and 407)

XXVIII. "Conte di Savoia," Quadruple-Screw Liner (between pages 422 and 423)

XXIX. Coal-Handling Plant, New Blackburn Meadows Power Station, Sheffield (between pages 456 and 457)

XXX. Blast Furnace Practice, American, Recent Developments (between pages 502 and 503)

PLATE

XXXI. Water Turbines, 24,000-h.p. Double-Runner, Tummel Bridge Power Station (between pages 512 and 513)

XXXII. Coke-Oven and Recovery Plant, Messrs. Lancashire Steel Corporation, Limited, Iriam (between pages 538 and 539)

XXXIII. Marine Turntable Slipway, 650-ton, Port of Lorient, Brittany (between pages 558 and 559)

XXXIV. Turbo-Alternator, 67,200-kW, Battersea Station of the London Power Company (between pages 584 and 585)

XXXV. Southampton Docks Extension, Southern Railway (between pages 612 and 613)

XXXVI. Ice Plant, Grimsby Ice Company, Ltd. (between pages 646 and 647)

XXXVII. Turbo-Alternator, 67,200-kW, Battersea Station of the London Power Company (between pages 666 and 667)

XXXVIII. Southampton Docks Extension, Southern Railway; New Graving Dock (between pages 696 and 697)

LITERATURE.

ABHANDLUNGEN aus dem Aerodynamischen Institut an der Technischen Hochschule, Aachen, Nos. 11 and 12, 499
Aerodynamics, Airscrew Theory and Design, 499
Aerodynamics, Mechanics of Aeroplane Flight for Use of Technicians, by M. Robin, 4
Aeronautique et Maritime, Association Technique, Bulletin, vol. xxxvi (1932), 581
Aeroplane Flight, Study of, by M. Robin, 4
Aeroplanes, Jane's All the World's Aircraft, 391
Africa, South and East, Year Book and Guide, 1933, 391
Agriculture, Land Drainage, by W. L. Powers and T. A. H. Teeter, 64
Air, Compressed, Technical Applications, by Prof. Vogdt, 714
Aircraft, Jane's All the World's, 391
Airscrew Theory and Design (Aerodynamischen Institut an der Technischen Hochshule, Aachen-Abhandlungen Nos. 11 and 12), 499
Ala Zeitungs Katalog, 1933, 175
Almanacs and Calendars, 26, 175, 391, 473
Aluminium and its Alloys, Heat Treatment and Annealing, by N. F. Budgen, 614
Amerikanische Heizungs und Lüftungspraxis, by Ing. K. R. Rybka, 581
Annuals and Reference Books, 26, 175, 365, 391, 473, 660, 687, 713
Arc Welding, by K. Meller, 352
Atomic Physics, Electrons and Waves, by H. S. Allen, 123
Atomic Physics, Recent Advances, by G. Castelfranchi. Translated by Dr. W. S. Stiles and Dr. J. W. T. Walsh, 295

BLUE BOOK, Electrical Trades Directory and Handbook, 391
Books, New, Notes on, 23, 352, 499, 515, 581, 714
Books Received, 72, 100, 130, 188, 218, 250, 304, 330, 356, 408, 434, 462, 490, 518, 544, 596, 622, 650, 678.
Brassey's Naval and Shipping Annual 1933, 601
Bridges and Roofs, Text-Book. Part II. Graphic Statics, by M. Merriman and H. S. Jacoby. Revised by E. B. Ebling, 581
Bridges, Steel, Design of, by F. H. Abrahams, 295
British Journal Photographic Almanac, 1933, 391
Builder's Prices, Analysis for Estimating, by J. J. Rea, 404
Building Construction, Steelwork, by C. Kersten, 123
Building Encyclopædia, Concise, compiled by T. Corkhill, 517
Building and Engineering Science Primer, Part I, by S. Owen, 352
Buildings, Factory, Steel-Framed, 132
Building Mechanics, Applied, by A. B. Turner, 23
Building Students, Mathematics for. Part I. by F. E. Drury and W. T. Harlam, 581
Bulletin de l'Association Technique Maritime et Aeronautique. Vol. XXXVI (1932), 581
By-Product Coking Industry, International Handbook of, by Prof. Dr. W. Gluud. English Edition by E. M. Myers, 669

CALENDARS and Almanacs, 26, 175, 391, 473
Casting, Economical, by R. Lehmann, 581
Charts, Temperature-Resistance, and Ohm's Law, by H. O. Cooper, 23
Chemical Engineering and Chemical Catalogue, 1933, 713
Cleaning Plant, for Coal, by S. H. North, 499
Clipper "Torrens," by E. C. Bowden-Smith, 714
Clubs, 1933, 473
Coal-Cleaning Plant, Modern, by S. H. North, 499
Coal, Competitive Position in United States, 642
Coil, Induction, Theory and Applications, by Dr. E. T. Jones, 4
Coking Industry, By-Product, International Handbook of, by Prof. Dr. W. Gluud. English Edition, by E. M. Myers, 669
Colliery Machinery and Its Application, by Sir R. A. S. Redmayne, 403
Colliery Manager's Pocket Book and Diary, 1933, 175
Colliery Year Book and Coal Trades Directory, 1933, 713
Commerce, Journal of, Annual Review, 160
Company Registrations, 1932, 146
Compressed Air, Technical Applications, by Prof. Vogdt, 714
Compressed-Air Terms and Standards, 64
Concrete Engineering, Vol. I. Practical Concrete, by J. Singleton-Green, 614
Concrete Roads, Improved, 492
Concrete Year Book, 1933, 473

DIARIES and Pocket Books, 26, 175
Diesel Engines in Electric Supply, with special reference to Peak Output, by M. Gercke, 23
Dieselmotoren in der Elektrizitätswirtschaft, insbesondere für Spitzendeckung, by M. Gercke, 23
Directory, Coal Trades, and Colliery Year Book, 1933, 713
Directory of Exporters and Mercantile Year Book, 1933, 660
Directory and Handbook, Electrical Trades, Blue Book, 391
Directory of Paper Makers, Great Britain and Ireland, 1933, 660
Directory of Shipowners, Shipbuilders and Marine Engineers, 1933, 473
Drainage, Land, by W. L. Powers and T. A. H. Teeter, 64
Druckluft in Der Technik, by Prof. Vogdt, 714

EARTH-RESISTANCE Measurement, 651
Economics for Engineers, by Dr. E. L. Bowers and R. H. Rowntree, 239
Economics of Tool Engineering, by A. P. Gwiazdowski and C. B. Lord, 516
Egypt and its Railways, by L. Wiener, 643
Electric Arc Welding, Manual of, Edited by E. H. Hubert, 295
Electric, Earth Resistance, Measurement, 651
Electric, Induction Coil, Theory and Applications, by Dr. E. T. Jones, 4
Electric, Ohm's Law and Temperature Resistance Charts, by H. O. Cooper, 23
Electric Telephony, Vol. I, by T. H. Herbert and W. S. Proctor, 373
Electric Telephone Transmission Theory, by W. T. Palmer, 404
Electrical Engineers, Institution of, Regulations for Signs, &c., 434
Electrical Trades Directory and Handbook, The Blue Book, 391
Electrical Undertakings, Garcke's Manual, 26
"Electrician" Annual Tables of Electricity Undertakings, 1933, 687
Electricity, Generation by Windmills, 714
Electricity, Laws of, and Electronic Theory, by M. Boll, 499
Electricity and Magnetism, Classical Theory of, by M. Abraham, revised by R. Becker, 107
Electricity Undertakings, Annual Tables, "Electrician," 1933, 687
Electronic Theory and the Laws of Electricity, by M. Boll, 499
Electrons and Waves, Introduction to Atomic Physics, by H. S. Allen, 123
Elektrische Lichtbogenschweissung, by K. Meller, 352
Elektrische Maschinen. Vol. 3. Die Transformatoren, by Prof. R. Richter, 64
Empire Survey Review, 671
Encyclopædia, Building, Concise, compiled by T. Corkhill, 517
Engineering—A Career—A Culture, 516
Engineering and Building Science Primer, Part I, by S. Owen, 352
Engineering, Industrial, and Management Problems and Policies, by R. M. Barnes, 106
Engineering on the Nile, 506
Engineering Science, Experimental, by N. Harwood, 23
Engineers, Economics for, by Dr. E. L. Bowers and R. H. Rowntree, 239
Engines, Diesel, in Electricity Supply, by M. Gercke, 23
Engines, Oil; History of, by A. F. Evans, 538
Estimating, Analysis of Builder's Prices, by J. J. Rea, 404
Etude Mécanique du Vol de l'Avion à l'Usage des Techniciens, by M. Robin, 4
Experimental Engineering Science, by N. Harwood, 23
Explosives, History, Manufacture, Properties and Tests, Vol. III (Second Edition), by A. Marshall, 23
Exponential and Hyperbolic Functions and their Applications, by A. H. Bell, 352
Exporters, Directory of, and Mercantile Year Book, 1933, 660
Exposé Électronique des Lois de l'Électricité, by M. Boll, 499

FACTORY Buildings, Steel-Framed, 132
Feilen, by Dr.-Ing. B. Buxbaum, 714
Ferro-Concrete Construction, by G. P. Manning, 352
Files, by Dr.-Ing. B. Buxbaum, 714
Firth-Brown Steels, 506
Flottes de Combat, Les, 1933, 473
Foundry Work, Economical Casting, by R. Lehmann, 581
Freighting and Freight Charges in Marine Transport, by K. B. Osberg, 516
French Naval Architects' Proceedings, Vol. XXXVI (1932), 581
Fuel, Pulverised, Firing, by S. H. North, 107

GARCKE'S Manual of Electrical Undertakings, 26
Gear Wheels, Lay-out and Calculation, by Dr.-Ing. G. Karrass, 714
"Glasgow Herald," 150th Anniversary Issue, 330
"Glasgow Herald" Trade Review, 100
Gründung von Masten für Freileitungen und für Bahnfahrleitungen und Bahnspeiseleitungen, by M. Süberkrüb, 23

HANDBOOK and Directory, Electrical Trades, Blue Book, 391
Handbook, International, of By-Product Coking Industry, by Prof. Dr. W. Gluud. English Edition by E. M. Myers, 669
Handbook, South American, 1933, 175
Handbuch der Rohrleitungen, by F. Schwedler, 404
Heating and Ventilating Practice, American, by Ing. K. R. Rybka, 581
History of the Oil Engine, by A. F. Evans, 538
Hydraulic Turbines, Tests of, Papers of the Institut für Strömungsmaschinen der Technischen Hochschule Karlsruhe. No. 2. Edited by Prof. W. Spannhake, 669
Hydraulics, by E. H. Lewitt, 515
Hyperbolic and Exponential Functions and their Applications, by A. H. Bell, 352

INDUCTION Coil Theory and Applications, by Dr. E. T. Jones, 4
Industrial Engineering and Management Problems and Policies, by R. M. Barnes, 106
Industrial Microscopy, by W. Garner, 373
Industrial Revolution in Scotland, by Dr. H. Hamilton, 613
Iron and Steel Industries, Statistics of, 1932, 473

JANE'S All the World's Aircraft, 391
Jane's Fighting Ships, 1932, 26
Journals and Newspapers, "Ala" Catalogue, 1933, 175

KÄLTEMASCHINE, Die, by Dipl.-Ing. M. Hirsch. Second Edition, 537
Kashmir, Trees of, Bulletin, 464

LAND Drainage, by W. L. Powers and T. A. H. Teeter, 64
Land Ho! by E. C. Bowden-Smith, 714
L'Egypte et ses Chemins de Fer, by L. Wiener, 643
Libraries, Scientific (Technical), by H. P. Spratt, 714
L'Idée Générale de la Mécanique Ondulatoire et de ses Premières Applications, by M. Boll, 352
Lift Maintenance Manual, 60
Lombard Code Service, 605

MAGNETISM and Electricity, Classical Theory of, by M. Abraham, revised by R. Becker, 107
Management Problems and Policies in Industrial Engineering, by R. M. Barnes, 106
Manual of Electric Arc Welding, Edited by E. H. Hubert, 295
Manufactured Products, Economic Control of Quality, by Dr. W. A. Shewhart, 63
Marine Engineers, Shipowners and Shipbuilders, Directory of, 1933, 473
Marine Transport, Freighting and Freight Charges, by K. B. Osberg, 516
Maritime et Aeronautique, Association Technique, Bulletin, Vol. XXXVI (1932), 581
Mast Foundations for Overhead Lines, by M. Süberkrüb, 23
Materials, Mechanics of Advanced, by F. B. Seely, 239
Materials, Strength of, by J. Case, 373
Mathematics, Exponential and Hyperbolic Functions and their Applications, by A. H. Bell, 352
Mathematics for Students of Building. Part I, by F. E. Drury and W. T. Harlam, 581
Mechanics, Building, Applied, by A. B. Turner, 23
Mechanics, Elementary, by A. Buckley and C. F. G. Macdermott, 23
Mechanics, of Materials, Advanced, by F. B. Seely, 239
Mechanics, Vol. I of Textbook of Physics, by E. Grimschl, 4
Mercantile Year Book and Directory of Exporters, 1933, 660
Metal-Cutting under Water, 357
Metallurgy, Heat Treatment and Annealing of Aluminium and its Alloys, by N. F. Budgen, 614
Metric Tables, Molesworth's, Seventh Revised Edition, 713
Microscopy, Industrial, by W. Garner, 373
Mining, Coal, Colliery Manager's Pocket Book and Diary, 1933, 175
Mining, Modern Practice in, Vol. V, Colliery Machinery and its Application, by Sir R. A. S. Redmayne, 403
Mining Year Book, 1933, 365
Mitteilungen des Institutes für Strömungsmaschinen der Technischen Hochschule Karlsruhe, No. 2. Edited by Prof. W. Spannhake, 669
Molesworth's Metric Tables. Seventh, Revised Edition, 713
Motor Body Building, Private and Commercial, by H. J. Butler, 123
Moulding, Economical, by R. Lehmann, 581

NAVAL Architects French Institution of, Proceedings. Vol. XXXVI (1932), 581
Naval, Jane's Fighting Ships, 1932, 26
Naval, Les Flottes de Combat, 1933, 473
Naval and Shipping Annual, Brassey's, 1933, 601
Newspapers and Journals, "Ala" Catalogue, 1933, 175
Nile, Engineering on, 506

OHM'S Law and Temperature-Resistance Charts, by H. O. Cooper, 23
Oil Engine, History of, by A. F. Evans, 538
Oil Engines. See *Engines*
Oil, Scientific Principles of Petroleum Technology, by Dr. L. Gurwitsch and H. Moore, 669
Overhead Lines, Mast Foundations for, by M. Süberkrüb, 23

PAPER Makers of Great Britain and Ireland, Directory of, 1933, 660
Parsons, Charles, Life and Work, by R. Appleyard, 601
Patents and Designs Acts, by Lord Marks and R. A. Wolstenholme, 537
Petroleum Technology, Scientific Principles of, by Dr. L. Gurwitsch and H. Moore, 669
Photogrammetry: Collected Lectures and Essays, 643
Photographic Almanac, British Journal, 1933, 391
Physics, Atomic, Electrons and Waves, by H. S. Allen, 123
Physics, Atomic, Recent Advances, by G. Castelfranchi. Translated by Dr. W. S. Stiles and Dr. J. W. T. Walsh, 295
Physics, Textbook of. Vol. I. Mechanics, by E. Grimschl, 4
Physics, Wave Mechanics, by M. Boll, 352
Piping, Handbook of, by F. Schwedler, 404
Pocket Books and Diaries, 26, 175
Power Plant Management, by W. N. Polakov, 404
Power Transmission Lines, Mast Foundations for, by M. Süberkrüb, 23
Products, Manufactured, Economic Control of Quality, by Dr. W. A. Shewhart, 63
Pulverised Fuel Firing, by S. H. North, 107

RADIO Sets, Testing, by J. H. Reyner, 23
Railways of Egypt, by L. Wiener, 643
Reference Books. See *Annuals and Reference Books*
Refrigerating Machines, by Dipl.-Ing. M. Hirsch. Second Edition, 537
Reinforced Concrete Association Review, 705
Reinforced Concrete Construction, by G. P. Manning, 352
Resistance, Earth, Measurement, 651
Roads, Concrete, Improved, 492
Roofs and Bridges, Text-Book, Part II. Graphic Statics, by M. Merriman and H. S. Jacoby. Revised by E. B. Ebling, 581

SAILING Ship "Torrens," by E. C. Bowden-Smith, 714
Sands, Clays and Minerals, 409
Schneidrehstähle, Die, by Dr.-Ing. W. Oertel and Dipl.-Ing. A. Grützner, 352
"Schweizerische Bauzeitung," Fiftieth Anniversary, 88
Science, Engineering, Experimental, by N. Harwood, 23
Science, Universe of, by Prof. H. Levy, 106
Scientific (Technical) Libraries, by H. P. Spratt, 714
Scotland, Industrial Revolution in, by Dr. H. Hamilton, 613
Sewerage and Sewage Treatment, by H. E. Babbitt, 63
"Sheffield Daily Telegraph" Industrial Supplement, 232
Shipbuilders, Shipowners and Marine Engineers, Directory of, 1933, 473
Shipowners, Shipbuilders and Marine Engineers, Directory of, 1933, 473
Shipping, Freighting and Freight Charges, by K. B. Osberg, 516
Shipping Guide, Handy, 73
Shipping and Naval Annual, Brassey's, 1933, 601
Shipping and Wireless, 515
Sollicitation Dynamique des Edifices Elancés par le Vent, by J. Lamoen, 352
South American Handbook, 1933, 175
South and East Africa, Year Book and Guide, 391
Springs for Road Transport, 130
Stahlhochbau, der, by C. Kersten, 123
Statistics of the Iron and Steel Industries, 1932, 473
Steel Bridges, Design of, by F. H. Abrahams, 295
Steels, Firth-Brown, 506
Steels, High Speed, by Dr.-Ing. W. Oertel and Dipl.-Ing. A. Grützner, 352
Steel and Iron Industries, Statistics, 1932, 473
Steel and its Practical Applications, by W. Barr and A. J. K. Honeyman, 516
Steelwork, Structural, by C. Kersten, 123
Structural Steelwork, by C. Kersten, 123
Structures, Slender, Wind Action on, by J. Lamoen, 352
Surveying, Photogrammetry: Collected Lectures and Essays, 643
Surveying, Practical, by G. W. Uskell, 516

TABLES, Metric, Molesworth's. Seventh, Revised Edition, 713
Telegraph Code Service, Lombard, 605
Telegraphy, Wireless, and Shipping, 515
Telephone Transmission Theory, Outline Notes on, by W. T. Palmer, 404
Telephony, Vol. I, by T. H. Herbert and W. S. Proctor, 373
Telephony, Wireless, Testing Radio Sets by, J. H. Reyner, 23

Temperature-Resistance Charts and Ohm's Law, by H. O. Cooper, 23
Testing Radio Sets, by J. H. Reyner, 23
Text Book on Roofs and Bridges, Part II. Graphic Statics, by M. Merriman and H. S. Jacoby. Revised by E. B. Ebling, 581
Thermometric Lag, 497
Tool Engineering, Economics of, by A. P. Gwiazdowski and C. B. Lord, 516
Tool Steels, High-Speed, by Dr.-Ing. W. Oertel and Dipl.-Ing. A. Grützner, 352
"Torrens," Clipper, by E. C. Bowden-Smith, 714
Town Planning, Recent Advances in, by T. Adams, in collaboration with F. L. Thompson, E. M. Fry and J. W. R. Adams, 372
Transformers, by Prof. R. Richter, 64
Transport, Marine, Freight Charges, by K. B. Osberg, 516
Transport, Road, Springs for, 130
Trees of Kashmir, Bulletin, 464
Turbines, Hydraulic, Tests of. Papers of the Institut für Strömungsmaschinen der Technischen Hochschule Karlsruhe. No. 2. Edited by Prof. W. Spannhake, 669
UNITED STATES, Competitive Position of, Coal in, 642
Universe of Science, by Prof. H. Levy, 106
VENTILATING and Heating Practice, American, by Ing. K. R. Rybka, 581
Verfrachtung und Frachtkostenberechnung im technischen Ueberseehandel, by K. B. Osberg, 516
WARSHIPS, Jane's Fighting Ships, 1932, 26
Warships, Les Flottes de Combat, 1933, 473
Waves and Electrons, Introduction to Atomic Physics, by H. S. Allen, 123
Wave Mechanics, by M. Boll, 352
Welding, Arc, by K. Meller, 352
Welding, Electric Arc, Manual of, Edited by E. H. Hubert, 295
Wind Action on Slender Structures, by J. Lamoen, 352
Windmills for the Generation of Electricity, 714
Wireless and Shipping, 515
Wireless Telephony, Testing Radio Sets, by J. H. Reyner, 23
Wirtschaftlicher konstruieren-billiger giessen, by R. Lehmann, 581
YEAR Book, Colliery, and Coal Trades Directory, 1933, 713
Year Book, Concrete, 1933, 473
Year Book and Guide, South and East Africa, 1933, 391
Year Book, Mercantile, and Directory of Exporters, 1933, 660
Year Book, Mining, 1933, 365
Year Books. See *Annuals*
ZAHNRADER. Part I, Aufzeichnen und Berechnen, by Dr.-Ing. G. Karrass, 714
Zeitungs Katalog, 1933, 175

PARAGRAPHS.

Accidents :
United States, Industrial Accident Statistics, 515

Aeronautics :
Air Force Display, 594
Air Photography and Archæology, 154
Air Transport, Growth of, 145, 655
Cardiff-Torquay Air Service, G.W.R., 382, 430, 570
Imperial Airways, Flight Statistics, 15
London-Paris Traffic, 21
Manchester, Air Port Wireless Station, 518
North-West Area Contracts, 189, 305
South African Airmen, Lunch to, 518
Welsh Aerodrome Schemes, 491, 545, 596
Wireless Equipment, Cairo-Cape Town Route, 30

Agriculture :
Forestry, Timber-Growing Experiment, Welsh Sand Dunes, 705
Grid Tower Compensation, 453
Machinery (Catalogue), 717
Overseas Trade Opportunities, 3, 127
Royal Show, 259

Alloys. See *Mining and Metallurgy*

Appointments, Awards, &c. :
Bellby Memorial Awards, 544
Bessemer Medal to Dr. W. H. Hatfield, 188
Chamber of Shipping, U.K., President, 217
Duddell Medal, to Prof. W. Gaede, 650
Gold Medal, R.I.B.A., to Sir C. Pears, 189
Gustave Trasenster Medal, to Dr. E. Branly, 201
Melchett, Lord, Presidency of British Science Guild, 596
Royal Aeronautical Society Medal, to Dr. L. H. Williams, 430; to Sir R. Glazebrook, 304
Russell Medal, to Dr. J. J. C. Bradfield, 331
Technical Education Bureau, International, 597
Tree Testimonial, Institution of Electrical Engineers, 679

Automobiles. See *Motor Cars*

Boilers. See *Engines and Boilers*

Bridges :
Carmarthen, Proposed New High-Level Bridge, 101, 409, 545, 623
Haverfordwest, G.W.R., Bridge, 382
Rhine Bridge, Concrete, Coblentz, 408
South Wales Bridge Proposals, 519

Buildings and Building Construction :
Architecture, Gold Medal for, Award, 189
Factory Buildings, Steel-Framed, 132
Fire Resistance of Materials, &c., Standard, 651
League of Nations Building, Geneva, 170

Canals :
Bridgewater-Taunton and Langport, Proposed, 545, 679
Manchester Ship, Report, 1932, 679
Panama Traffic, 431

Catalogues :
146, 236, 266, 292, 318, 370, 448, 477, 558, 610, 638, 665, 692, 717
Andrews, Cuthbert, 638
Armstrong, Sir W. G., Whitworth & Co. (Engineers), Ltd., 448
Arrol, Sir Wm., & Co., Ltd., 318
Atkins (Peterborough), Ltd., 692
Automotive Products, Ltd., 266, 477
Babcock & Wilcox, Ltd., 146
Bailey, Sir W. H., & Co., Ltd., 266
Barson, A., & Co., Ltd., 665
Bastian & Allen, Ltd., 448
B.E.N. Patents, Ltd., 610
Beck, O. N., 266
Bellis & Morcom, Ltd., 717
Bell's Asbestos & Engineering Supplies, 692
Benjamin Electric, Ltd., 146
Blackman Export Co., Ltd., 477

Catalogues—*continued.*
Blackstone & Co., Ltd., 146, 717
Boby, R., Ltd., 448, 692
Braby, F., & Co., Ltd., 692
British Aluminium Co., Ltd., 665
British Electric Transformer Co., Ltd., 448
British Insulated Cables, Ltd., 266, 370, 558
British Oil Cleaners, 318, 717
British Oxygen Co., Ltd., 370
British Rema Manufacturing Co., Ltd., 370, 717
Brotherhood, P., Ltd., 477
Brown, David, & Sons (Hudd.), Ltd., 370, 638
Buck & Hickman, Ltd., 370
Burnand, W. E., & Co., 610
Burton, Griffiths & Co., Ltd., 318
Butler Machine Tool Co., 370, 638
Canning, W., & Co., Ltd., 292, 448
Cement Marketing Co., Ltd., 236
Chloride Electrical Storage Co., Ltd., 318
Clang, Ltd., 665
Craven Brothers (Manchester), Ltd., 292
Cresall Manufacturing Co., 146
Crofts (Engineers), Ltd., 448
Crompton Parkinson, Ltd., 146
Davidson & Co., Ltd., 266, 717
Davy Brothers, Ltd., 292
Dobbie, McInnes & Clyde, Ltd., 717
Donovan & Co., 665
Drayton Regulator & Instrument Co., Ltd., 236, 477
Dunlop Rubber Co., Ltd., 146
Elliott Bros. (London), Ltd., 717
Ellison, George, Ltd., 146, 370
Engineering & Lighting Equipment Co., Ltd., 558
English Electric Co., Ltd., 146, 477, 558
Everseal Manufacturing Co., 610
Evershed & Vignoles, Ltd., 558
Firth, Thomas, & John Brown, Ltd., 638
Foundry Equipment Co., Ltd., 717
Fowler, J., & Co. (Leeds), Ltd., 692
General Electric Co., Ltd., 146, 558
Gordon, J., & Co., Ltd., 370, 448
Gwynnes Pumps, Ltd., 448
Hadfields, Ltd., 146, 236, 448
Hall, B. J., & Co., Ltd., 236
Harland & Wolff, Ltd., 146, 477
Henley's, W. T., Telegraph Works Co., Ltd., 146, 717
Higgs, G. N. (Chromaloid), Ltd., 692
Hildebrandt, 266
Hilger, Adam, Ltd., 292
Hoffmann Manufacturing Co., Ltd., 692
Holden & Brooke, Ltd., 236, 692
Holman Bros., Ltd., 477
Holmes, J. H., & Co., Ltd., 448
Hopkinsons, Ltd., 292
Hydraulic Engineering Co., Ltd., 318
Igranic Electric Co., Ltd., 448, 638, 717
International Construction Co., Ltd., 558
Ismalia Valve Co., 236
Jackson, J. G., and Crockatt, Ltd., 146
Jenkins, R., & Co., Ltd., 318
Jessop, Wm., & Sons, Ltd., 477
Jones, E. H. (Machine Tools), Ltd., 292
Kandem Electrical, Ltd., 370
Kellogg, W. M., Co., 610
Kirkstall Forge, Ltd., 558
Klaxon, Ltd., 477
Lancashire Dynamo & Crypto, Ltd., 638
Liverpool Electric Cable Co., Ltd., 477
Lunken Co., Ltd., 236, 610
M. & C. Switchgear, Ltd., 146
Marryat & Scott, Ltd., 370
Metropolitan-Vickers Electrical Co., Ltd., 610
Mirrlees Watson Co., Ltd., 292, 665
Morse Chain Co., Ltd., 370
National Gas & Oil Engine Co., Ltd., 448, 717
Negretti & Zambra, 266
Newton, Chambers & Co., Ltd., 610
Oerlikon, Ltd., 477
Patent Lightning Crusher Co., Ltd., 638
Payen, J., Ltd., 717
Peebles, Bruce, & Co., Ltd., 370
Pels, H., & Co., Ltd., 448
Platt Brothers & Co., Ltd., 665
Pollock, F., & Co. (Bearings), Ltd., 692
Power-Gas Corporation, Ltd., 717
Premier Gas Engine Co., Ltd., 638
Radiovisor Parent, Ltd., 692
Ransomes & Rapier, Ltd., 448, 477
Reavell & Co., Ltd., 665
Renold & Coventry Chain Co., Ltd., 448

Catalogues—*continued.*
Reyrolle, A., & Co., Ltd., 448, 717
Rhodes, Brydon & Youatt, Ltd., 717
Richter & Pickis, 717
Rolland, J., & Co., 146
Round, B. J., & Sons, 236
Russ, 477
Ruston & Hornsby, Ltd., 146
Selas Gas & Engineering Co., Ltd., 638
Selson Machine Tool Co., Ltd., 717
Smith, J. W., 448
Spencer (Melksham), Ltd., 638
Steel Barrel Co. (of Uxbridge), Ltd., 292
Stothert & Pitt, Ltd., 717
Sturtevant Engineering Co., Ltd., 370, 558
Switchgear & Cowans Ltd., 146
Tangyes, Ltd., 692
Taylor, Tunnicliffe & Co., Ltd., 717
Telefon- A.-B. L. M. Ericsson, 370
Underfeed Stoker Co., Ltd., 477
Vibration Specialty Co., 610
Visco Engineering Co., Ltd., 610
Waddells (Stratford Steel Equipment, Ltd.), Ltd., 610
Wadkin & Co., 236, 370, 665
Ward, T. W., Ltd., 236
Westinghouse Brake & Saxby Signal Co., Ltd., 236
Wheels, H. M. C., Ltd., 370
Wiggins, H., & Co., Ltd., 370
Wigglesworth, Frank, & Co., Ltd., 146
Wild-Barfield Electric Furnaces, Ltd., 665
Willmot Trucks & Products, Ltd., 692
Wilson Brothers (Leeds), Ltd., 692
Zeiss, Carl, 292

Cement and Concrete :
Coloured Concrete (Catalogue), 236
Review, Reinforced Concrete Association, 705
South Wales Cement-Making, 519

Chemistry. See *Physics and Chemistry*

Coal :
Anthracite Duff for Power, 434
Arches, Yieldable Steel, for Mines, 623
Australia, Wonthaggi Colliery, Victoria, 102
Brown Coal Production, 373
Canada, Montreal Imports of British and Foreign Coal, 145
Cardiff, 14, 45, 101, 131, 161
Cefn-Coed Colliery, 161
Cleaner Coal Plea, 330
Coal Breakage Problems, 623
Colliery Group, Managerial Changes, 463
Egyptian Railway Contract, 14
Forest of Dean, New Colliery, 596
Illingworth Coal Carbonisation and North American Rights, 188
Middlesbrough Coke, 14, 45, 72, 100, 131, 161, 188, 219, 250, 279, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705
Miners' Welfare Fund, Welsh Contribution, 131
Monmouthshire and South Wales Coal Owners' Association, 331
Newfoundland Railway, Coal Barter for Props, 14
Pulverised Coal, Proposed Use in Boiler Furnaces, 705
Sheffield, 15, 44, 73, 100, 130, 160, 189, 218, 251, 279, 304, 331, 357, 383, 408, 435, 463, 490, 519, 544, 571, 597, 623, 651, 679, 705
Shipment Appliances, Improved, 131
South Wales and Coal-Oil, 188
South Wales, Collieries and Quota Arbitration, 251; Long Loading Hours, 14; Output Statistics, 331; Shipments, 14, 45; Trade and Oil-Fuel, 45
Stemming, New, for Shot Holes, 679
Swansea Area, Special Quota, 304
Wagons, 20-ton, G.W.R., for Welsh Collieries, 131, 251, 278
Welsh Anthracite Seams, 409, 434, 571
Welsh Coal Industries, "Back to Coal" Campaign, 101
Welsh Coal, Research as to Uses, 304
Welsh Mining Engineers, Visit to Buxton Research Station, 571

Colleges. See *Education*

Concrete. See *Cement and Concrete*

Cranes, Conveyors, &c. :
Conveying Apparatus (Catalogue), 477
Conveyors (Catalogue), 638
Cranes, Electric Overhead Travelling, Standard, 7
Cranes, General (Catalogue), 318
Lift Maintenance Manual, 60
Lifts, Goods (Catalogue), 370

Docks. See *Harbours, &c.*

Education :
Cardiff Technical College, Recognition by L.C.C., 623
Cardiff University, Metallurgy Buildings, 304
Commercial Education, British Association for, 435
Dunlop Rubber Co., Technical Education of Young Engineers, 435
Economics, School of, Lectures on Industrial Psychology and Office Work, 408
Electrical Engineering Lectures, 100
Engineering Technology, British Institute of, 170
Faraday House Scholarship Examinations, 490
Hygiene, Tropical, Lectures, 260
Portland House Travelling Scholarship, 178
Skilled Employment and Apprenticeship Association, 597
Technical Education Bureau, International Appointments, 597

Electricity :
Acropolis, Flood Lighting of, 357
Apparatus (Catalogues), 146 (2), 717
Australian Telephone Service, 182
Battye Memorial Fund, 13
Blackburn Meadows Station, 383
Blast-Furnace Controls (Catalogue), 610
Bus Bars, Standard, 678
Cable Boxes (Catalogue), 717
Cable-Manufacture Film, 100
Cables (Catalogue), 477
Cables, Underground, to West Wales, 304, 434
Calcutta Supply, 154, 595
Canada, Electrical Code, *Errata*, 249
Ceiling Fans, Electric, Standard, 679
Clocks, Mains Operated, Standard, 399
Earth-Resistance Measurement, 651
Egypt, Upper, Electrically Worked Irrigation, 60
Electricity Commissioners' Report, *Erratum*, 54
Electric Signs and Luminous Discharge Tubes, Regulations, 434
Electroplating (Catalogue), 292
Equipment, Electrical (Catalogue), 558
Fittings, Electric (Catalogue), 665
Fuses (Catalogue), 448
Generation Statistics, Great Britain, 73, 229, 553, 654
Generators (Catalogue), 610
Grid Towers, Landowners' Compensation, 453
Heaters, Immersion, Embedded-Type, 14
Insulating Material, New, Glyptal, 623
Insulators (Catalogue), 717
Lamps, Electric, Standard, 30
Lamps, Railway Signalling, Standard, 179
Light Fittings (Catalogue), 146, 370, 558, 665
Lectures in Electrical Engineering, 100
Lesco House, Electrical Heating of, 58
Lighting (Catalogue), 146
Lighting, City of London Company, 356
Light-Sensitive Apparatus (Catalogue), 692; *Erratum*, 705
Link-Disconnecting Boxes (Catalogue), 146
Lithuania, Hydro-Electric Power Development, 513
Lombard Service Code, 605
London Underground Railway, Artificial Lighting, 678
Magnetising Appliances (Catalogue), 610
Mall, London, Illumination of, 88
Manchester, Electrical Industry, 15, 45, 130, 219, 356, 383, 463, 519, 545
Measuring Instruments (Catalogue), 370
Mercury Rectifiers, Standardised Manufacture, 506
Motors (Catalogues), 146 (2), 370, 448, 477 (2), 558, 638
Office Building, Electrically Heated, 58
Penstock Welds, X-Ray Testing of, 671

Electricity—*continued.*

Plugs and Sockets, Flame-Proof, Standard, 680
Poles, Steel, Telegraph and Telephone, Standard, 605
"Rhino" Flexible Trailing Cable, 500
Russia, Power Station Development in, 127
Severn Barrage Scheme, Local Objections, 304, 545, 651
Ship Propulsion, Turbo Electric, 25th Anniversary, 520
Signalling, Tractive-Armature Relays, Standard, 709
Soldering Irons, Electric, 478
Starters, Motor (Catalogues), 448, 638, 717
Supplies, Electrical (Catalogue), 266, 558
Swimming Bath, Electrically-Heated, 666
Switchboard Instruments, Small-Case, 571
Switches, Air-Break, Standard, 668
Switches (Catalogues), 477
Switchgear (Catalogues), 146 (2), 370
Telegraphy, Wireless, Cairo-Cape Town Air Route, 30
Telephone Service, Wireless, Micro-Wave, 236
Telephony, Wireless, Cairo-Cape Town Air Route, 30
Telephony, Wireless, Cape Town Broadcasting Station, 46
Tir John Power Station, Swansea, 219, 278, 304, 463, 491, 519, 571, 597 (*Erratum*), 651
Tomato Culture, Electric Soil Heating, 92
Transformers (Catalogue), 448
Transmission Towers, Earth Resistance of, *Addendum*, 250
Tubes, X-Ray (Catalogue), 638
Wales, Carmarthenshire Light and Power Scheme, 705
Wales, South, Power Company's Development, 382
Watford By-Pass Road, Lighting of, 679
Welded Work (Catalogue), 292
Welding Arc (Catalogue), 477
Welding, Bradford Lectures, 79
Welsh Hydro-Electric Scheme, 161
Wire, Copper, High-Conductivity, Standard, 650
Wires, Galvanised, Standard, 175
Wiring and Line Material (Catalogue), 370
Yorkshire, Distribution Figures, 331

Engines and Boilers :

Boilermen and Stokers, Proposed National Certificate, 81
Boilers, Electrically-Heated (Catalogue), 448
Boilers, Modern, *Erratum*, 382
Boilers, Power Station, Colliery Water for, 463
Boilers, Steam (Catalogue), 146, 318
Boilers, Tanks, &c. (Catalogue), 318
Boiler Water Gauge (Catalogue), 717
Indicators, Engine (Catalogue), 510
Pipe Bends for Pipe Lines (Catalogue), 610
Stokers and Boilermen, Proposed National Certificate, 81
Turbine, Lost Russian, 680
Turbines, Steam (Catalogue), 717
Turbine, Super-Pressure, for Moscow, *Erratum*, 330
Valves, Reducing (Catalogues), 266, 370, 448

Errata and Addenda :

Airless Injection Engine, National, 72 B.H.P., 288
Airless Injection Engine, Two-Stroke, 331
Boby Precipitation Plant, 305
Boilers, Modern, 382
Canadian Electrical Code, 249
Ease of Starting with Benzol, &c., Mixtures, 430
Electricity Commissioners' Report, 54
Leipzig Fair, 388
Light-Sensitive Apparatus, 705
Locomotives, Compression-Ignition Engined, 107
Mechanical Engineers, Institution of, 107, 596
Metal-Price Diagram, 304
Ships, Gyroscopic Stabilisation of, 596
Steel, Inclusion in, 552
Temperature Measurement and Control, 275, Tir John North Super-Power Station, 597
Transmission Towers, Earth Resistance, 250
Turbine, Super-Pressure, for Moscow, 330
"Valmax" Valve Steel, 304

Exhibitions :

Anglo-Palestine, 219
British Industries Fair, Birmingham, 46, 189
Home-Efficiency Exhibitions, 110
Leipzig Fair, *Erratum*, 388
Milan International Fair, 161
New York Automobile Show, 478
Oil Industries, International, 391
Railway, Model, 470
Sanitary Institute, Royal, 100
Sheffield Model Engineering and Allied Trades, 356
Shipping, Engineering and Machinery, 704
South Wales Mining Research Exhibition, 161
Welsh Ship Model Exhibition, 188

Explosions. See *Accidents*

Ferro-Concrete. See *Cement and Concrete*

Flying Machines. See *Aeronautics*

Gas :

Appliances, Gas (Catalogue), 638
Neath Corporation Plant, 571
Washer, Gas (Catalogue), 610

Gas and Oil Engines :

Airless Injection Engine, National, *Erratum*, 288
Airless Injection Engine, Two Stroke, *Addendum*, 331
Compression Ignition Engine, *Erratum*, 107
Diesel Engines, Craig Company's Output, 262
Engines, Oil (Catalogues), 146, 448, 477, 638, 717
Engines, Oil, Stationary (Catalogue), 146
Engines, Petrol (Catalogue), 146
Overseas Trade Opportunities, 72

Harbour Docks and Piers :

Australia, Mackay Deep-Water Harbour, 182
Penstock Valves (Catalogue), 236
South Wales and River and Coastal Water Pollution, 45, 161, 251
Welsh Port Improvements, G.W. Railway, 101, 219
Wye River, Proposed Flood Works, 519

Hydraulics :

Pumps (Catalogues), 448, 665, 692 (2), 717

Industries and Commerce :

Africa, South, and U.K. Commerce, 54
Belgium, British Chamber of Commerce, 100
Board of Trade Markings, Imported Rivets, 44; Wire Rods and Wire Goods, 197; Engineering Materials, 490; Drawing Instruments and Hollow Ware, 526; Rivets and Chucks, 673
Bolton Industrial Development, 356
British Industries Federation, 81
Canada, Promotion of Anglo-Canadian Trade, 13, 703; Toronto Trade Commissioner's Visit, 636; Tariff Board, Revision Question, 703
Commerce, Journal of, Annual Review, 160
Commercial Education, British Association for, 435
Company Registrations, 1932, 146
Contracts, 14, 44, 72, 100, 160, 188, 218, 250 278, 304, 382, 408, 434, 462, 490, 518, 544, 570, 622, 650, 678, 704
Discharge Tubes, Cathode-Glow Gas-Filled, Duty Question, 418
"Glasgow Herald" Trade Review, 100
India, Mettur Project Developments, 658
Lancashire Industrial Development Council, 704
Manchester Area Contracts, 45, 72, 130, 189, 219, 250, 278, 305, 331, 383, 409, 491, 519, 545, 650, 679
Manchester Chamber of Commerce Survey, Engineering and Metals, 72
Manchester General and Constructional Engineering, 15, 45, 72, 101, 130, 160, 188, 218, 250, 278, 305, 331, 356, 383, 409, 463, 491, 519, 545, 571, 596, 623, 650, 679, 704
Metal Goods, Wrought, Import Duties, 705
Metal-Price Diagram, *Erratum*, 304
Overseas Trade Opportunities, 3, 54, 72, 79, 92, 98, 127, 170, 304, 305, 321, 327, 462, 520, 570, 591, 623, 637, 679, 688
Personal, 14, 44, 72, 100, 130, 160, 188, 218, 250, 278, 304, 330, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704.
Psychology, Industrial, and Office Work, 408
Rhodesia, Southern, Trading Methods, 462
Russia, British Embargo and the Heavy Industries, 467, 596
Sheffield, History, Development, &c., 651
Sheffield Industries in 1932, 232
Sheffield Publicity, Canadian and U.S. Broadcasting, 679
South Wales, All-Electric Tinplate Works, 382; Engineering Industries, 651; New Aluminium Alloy Manufacture, 73; Tin Plate Activity, 73
Sugar Factory, Beet, Pembrokeshire, Proposed, 596
Tenders, 44, 100, 130, 188, 218, 250, 304, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704
Trade Protection Societies, National Association, 417
United States, Trading Methods, 92

Institutions. See *Technical Societies*

Iron and Steel :

Arches, Yieldable Steel, for Coal Mines, 623
British Production, 14, 116, 575, 679
Cast Irons, Austenitic, Nickel-Copper-Chromium, 705
Cleveland, 14, 45, 72, 100, 131, 161, 189, 219, 250, 279, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705
Dowlais Works, New Blast Furnace, 278
East Coast Hematite, 14, 45, 72, 100, 131, 161, 188, 219, 250, 279, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705
Firth-Brown Steels, 506
Foundry Patterns, Standard Marking and Colouring, 140
Gate, Cast-Iron, Welding Repair, 116
Lancashire Steel Corporation's Developments, 409; Royal Visit, 519; New Wire-Rod Mill, 160
London Iron and Steel Exchange, 282
Manchester, 15, 45, 72, 101, 130, 160, 189, 218, 250, 278, 305, 331, 356, 383, 409, 463, 491, 519, 545, 571, 596, 623, 650, 679, 704
Middlesbrough Foreign Ore, 14, 45, 72, 100, 131, 161, 188, 219, 250, 278, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705
Middlesbrough Scrap Prices, 14, 45, 72, 100, 131, 161, 189, 219, 250, 279, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705
North-West Area, Works, &c., Reopening, 15, 571
North Western Hematite, 15, 45, 101, 250, 278, 356, 409, 519, 545, 596, 623, 650
Pig Iron Price Increase, 491
Rationalisation Scheme, 357
Rods, Pure Iron, for Spectrographic Work, 472
Russian Contracts, South Wales, 45
Scottish Shipments, 15, 44, 73, 101, 130, 160, 189, 219, 251, 278, 305, 331, 357, 382, 409, 435, 463, 491, 519, 545, 570, 597, 623, 704
Scottish Trade, 14, 44, 73, 101, 130, 160, 189, 219, 251, 278, 305, 331, 357, 382, 409, 435, 463, 491, 519, 545, 570, 597, 623, 651, 679, 704
Sheffield, 15, 44, 73, 100, 130, 160, 189, 218, 250, 279, 304, 331, 356, 383, 408, 435, 463, 490, 519, 544, 571, 597, 623, 651, 679, 705
Skinningrove Company's Alterations and Improvements, 279

Iron and Steel—*continued.*

South Africa, Steel Pipe Contract, 623
South Wales Output, 188
Stainless Steel Sheets, Import Duties, 100
Steels, Firth-Brown, 506
Steels, General (Catalogues), 477, 558
Steel, Inclusions in, *Erratum*, 552
Steels, Special (Catalogues), 448, 558, 638
Steelmakers' Association, British, 73
Steelwork (Catalogue), 448
Tees Imports, 161, 383, 491
Tees Shipments, 14, 161, 279, 383, 491, 622
Tees-Side Amalgamation Proposal, 279
Tredegar Works Plant, Transfer to Lincolnshire, 382
"Valmax" Valve Steel, *Erratum*, 304

Irrigation :

Egypt, Upper, Electrically-Driven Pumping Stations, 60

Labour Questions. See *Trade Societies*

Literature. See *Literature Index*

Locomotives. See *Railways*

Machine and Other Tools :

Coventry Development, 434
Drilling Machines (Catalogue), 292
Grinding Tool, Hand (Catalogue), 477
Leipzig Fair, Grinder, *Erratum*, 383
Machine Tool Development, Lectures, 189
Machine Tools General, (Catalogues), 292, 318, 434, 717
North West Area Trade, 15, 45, 160, 623, 650, 704
Presses, Crank-Power (Catalogue), 692; Folding (Catalogue), 448; Hydraulic (Catalogue), 292
Saws (Catalogue), 665
Shaping Machines (Catalogues), 370, 638
Thread-Grinding Machines (Catalogue), 692
Wood-Sawing Machines (Catalogue), 236, 370
Woodworking Machinery, 236, 370, 665, 692

Marine Engineering. See *Engines and Boilers ; Ships and Shipbuilding*

Markets :

Cleveland Iron, 14, 45, 72, 100, 131, 161, 188, 219, 250, 278, 305, 330, 356, 383, 409, 435, 462, 491, 518, 545, 571, 597, 622, 651, 678, 705

Mining and Metallurgy :

Alloys, Quenching and Temperature Phenomena, 110
Aluminium Alloy, New, South Wales Manufacture, 73
Aluminium Competition, International, Awards, 461
Australia, New South Wales Mineral Production, 197
Beilby Memorial Awards, 544
Canadian Asbestos, 584
Cast Irons, Austenitic, Nickel-Copper-Chromium, 705
Dolgelly Gold Mines, Proposed Re-working, 679
Fans (Catalogue), 717
Foundry Patterns, Standard Marking and Colouring, 140
Foundry Plant (Catalogue), 717
Furnaces, Electric (Catalogues), 477, 665
Manchester Area, Copper Refining in, 383
Metal Coating (Catalogue), 236
Metal-Cutting under Water, 357.
Mill and Foundry Machinery (Catalogue), 558
Nickel Machinery, &c. (Catalogue), 370
Overseas Trade Opportunities, 79
Presses, Extrusion (Catalogue), 146
Spectroscope for Non-Ferrous Metals (Catalogue), 292
Temperature Measurement and Control, *Addendum*, 275
Welsh Metallic Ore Mining, 409
Welsh Lead Mines, Proposed Re-Working, 705

Miscellaneous :

Aluminium Products (Catalogue), 665
Archæology and Air Photography, 154
Ball Mill (Catalogue), 266
Battye Memorial Fund, 13
Binding Machine (Catalogue), 236
Boby Precipitation Plant, *Erratum*, 305
Calendar, 489
Cardiff Orbital Road Scheme, 330, 463
Chinese Road Construction, 672
Compressed-Air Terms and Standards, 64
Compressors, Air (Catalogue), 665
Contracts, 14. 44, 72, 100, 160, 188, 218, 250, 278, 304, 382, 408, 434, 462, 490, 518, 544, 570, 622, 650, 678, 704
Couplings (Catalogue), 370
Cream Separators, Listers' New Factory, 296
Cromptonians, Old, Dinner, 366
Cutting Machines, Oxygen (Catalogue), 370
Davidson & Co.'s Mechanical Draught and Fan Activities, 446
Destructor, Refuse, Swansea Costs, 73
Dust Collector (Catalogue), 717
Earth-Boring Machine (Catalogue), 318
Eliminators, Automatic, for Water-Turbine Supplies, 480
Empire Survey Review, 671
Engineers' Supplies (Catalogue), 692
Excavators (Catalogues), 477, 717
Fans, "Adra" 306
Fans (Catalogues), 266, 477, 558, 717
Filters (Catalogue), 266, 610
Fuel, Colloidal, Development, 219
Furniture, Steel (Catalogue), 610
Glamorgan, Unclassified Road Costs, 651
"Glasgow Herald," Anniversary Issue, 330
Golfing Society, Engineering, 671
Grinding, Mixing, &c., Machines (Catalogue), 717
Heating Congress, Industrial, Paris, 705
Heating, &c., Plant (Catalogue), 370

Miscellaneous—*continued.*

Heating and Ventilation, Tootal, Broadhurst, Lees, New Building, 434
Hospital, Tuberculosis, South Wales, 705
Hygiene, Tropical, Lectures, 260
Hygrometers (Catalogue), 266
Jugoslavia Communications, 605
Kashmir, Trees of, 464
Lantern-Slide Loans, 235
League of Nations' Building, Contracts, 170
Lettering (Catalogue), 448
Libraries and Information Bureau, Special, 405
Machinery, General (Catalogue), 236
Manchester, General and Constructional Engineering, 15, 45, 72, 101, 130, 160, 189, 218, 250, 278, 305, 331, 356, 383, 409, 463, 491, 519, 545, 571, 596, 623, 650, 679, 704
Metal-Cutting under Water, 357
Nile, Engineering on, 506
Oil-Cleaning Machine (Catalogue), 318
Oil Cooler (Catalogue), 236
Oil Depot, Russian Oil Products, Ltd., 278
Oil Purifying (Catalogues), 292, 717
Operation Recorder, Single (Catalogue), 558
Packing Machines (Catalogue), 146
Pembrokeshire, Public Works Developments, 679
Personal, 14, 44, 72, 100, 130, 160, 188, 218, 250, 278, 304, 330, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704
Photography, Air, and Archæology, 154
Piccadilly Traffic Control, 596
Pipe Flanges, Standard, 698
Pipe Lines, Chemical, Standard, 101
Rat Plague, Musk, in Wales, 357
Recording Instruments (Catalogue), 236
Refrigerating Machinery (Catalogue), 692
Road Atlas, Pocket, 477
Roads, Concrete, Control of Cracks, 492
Road Developments in South Wales, 434
Road Federation, British, 409
Road Rollers (Catalogue), 146
Roads, Wider, Glamorgan County Council and Costs, 101
Roadway Refuges, Illuminated Guard Post, 462
Rubber Products (Catalogue), 146
Rule, Nevson Tangraph, 448
"Sands, Clays and Minerals," 409
"Schweizerische Bauzeitung," Fiftieth Anniversary, 88
Signals, Street Traffic (Catalogue), 717
Soil Renovation, 373
South Wales, Snowstorm Damage, 251, 278
Spraying Equipment (Catalogue), 448
Stairs, Metal Frame (Catalogue), 692
Standards Institution, British, 7, 30, 101, 140, 175, 399, 544, 605, 650, 651, 668, 678, 679, 680, 698, 709
Stone-Breaking Machines (Catalogue), 638
Stone Crushers (Catalogue), 146
Sugar-Beet Presses, Repair by Welding, 490
Sugar Machinery (Catalogue), 292
Swansea Corporation, Street and Road Widening, 519, 651
Swansea, Dust Destructor Costs, 73
Swimming Bath, Electrically-Heated, 666
Tachometers (Catalogue), 236
Tenders, 44, 100, 130, 188, 218, 250, 304, 356, 382, 408, 434, 462, 490, 518, 544, 570, 596, 622, 650, 678, 704
Textile Machinery (Catalogue), 665
Thermometric Lag, 597
Tootal, Broadhurst, Lee & Co.'s New Building, Heating and Ventilation, 434
Totalisator Machinery, Manufacturers' Protest Against Ban, 88
Trevithick Memorial, 219, 463
Tropics, Hygiene in, 704
Trucks, Hand (Catalogue), 692
Tuberculosis Hospital, South Wales, 705
United Water Softeners, Ltd., New Building, 66
Vibration Measurement (Catalogue), 610
Waterproofing, Transparent (Catalogue), 610
Welded Work (Catalogue), 292
Welding, Bradford Lectures, 79
Welding Equipment (Catalogue), 370
Westinghouse Association, Ex-British, Dinner, 251
Wheels and Castors (Catalogue), 730
Windows, Metal-Frame (Catalogue), 692

Motor Cars, &c. :

Australia, Trackless Trolley Omnibuses for Sydney, 201
Automobile Parts (Catalogue), 477
Cardiff 'Bus Centre Proposal, 331, 357
Cardiff 'Buses, Trackless Trolley, 679
Cardiff 'Buses, Use of Crude Oil for, 330, 463, 491
Chromium Plating (Catalogue), 692
Gaskets (Catalogue), 717
Lithuania, Motor-Bus Statistics, 369
Llanelly, Trolley-Bus Service, 219
Manchester Area, Transport Contracts, 130, 278, 305, 545, 704
Motor Manufacturers and Traders' Society, Col. Hacking's Retirement, 278
New York Automobile Show, 478
Overseas Trade Opportunities, 98, 305, 327, 570, 679
Springs for Road Vehicles, 130
Starting, Ease of, with Benzol, &c., Mixtures, *Errata*, 430
Tractors, &c., Oil-Engined (Catalogue), 477
Vehicles Registered, 234, 658

Naval :

British Navy and Coal-Oil, 188
"Decoy," H.M. Destroyer, 100
German Fleet, Ex-, Salvage, 545
"Gonçalo Velho," Portuguese Sloop, Trials, 108
Portugal, Launch of Destroyer "Lima," 652
Portuguese Sloops, 704
"Woolwich," H.M. Destroyer, Repair Ship, Contract, 305

Naval. See also *Aeronautics*

Obituary. See GENERAL INDEX

Physics and Chemistry :
Acoustics Service Laboratory, 651
Earth-Resistance Measurement, 651
Guthrie Lecture, X-Ray Wave Measurements, 650
Light-Sensitive Apparatus (Catalogue), 602 ; *Erratum*, 705
Nobel Chemistry Prize, 26
Optical Instruments (Catalogue), 292
Spectrography, Pure Iron Rods for, 472

Power Plants. See *Electricity*

Power Transmission :
Bearings, Ball and Roller (Catalogues), 602 (2)
Chain Drives (Catalogue), 370
Clutch, Driving (Catalogue), 370
Gearing, Toothed (Catalogues), 370, 638
Gear, Double-Helical (Catalogue), 448
Power Transmission, General (Catalogue), 146

Railways and Locomotives :
Australian Railways, Economies on, 532
Buffers, Hydraulic (Catalogue), 448
Cardiff Signal Boxes, G.W.R., 382
China, Railway Material for, 609
Coach, Armstrong Oil-Electric, 330
Jugoslavia Communications, 605
Lamps, Electric, for Signalling, Standard, 179
Lithuania, Telsiai-Kretinga Railway, 495
Locomotive, Compression-Ignition Engined, 107 (*Erratum*)
Locomotive Contracts, 409
Locomotives, Diesel (Catalogue), 448
Locomotive, Electric, Chicago Progress Exhibition, 520
Locomotives, Oil Engine (Catalogues), 602, 717
Locomotives, Shunting, Electric (Catalogue), 318
London Underground, Artificial Lighting, 675
Model Railway Exhibition, 470
Nanking-Pukow Train Ferry, 680
Railway Purchases, 1932, 650
Signalling, Tractive Armature Relays, Standard, 709
Signals (Catalogue), 236
South Wales Developments, G.W.R., 219
United States, Advantages of Suburban Electrification, 623
Wales, Railway Material Contracts, 278
Wheel Drops, Improved, at Locomotive Depots, 43
Wheels, Railway, Solid Rolled, Standard, 544

Schools. See *Education*

Sewage and Drainage :
Mid-Glamorgan Drainage, 596
Swansea Sewerage Works, 596, 651

Ships and Shipbuilding :
Australian Lighthouse Equipment, 279
Bolivia, Motor Boat for Mountain Lakes, 14
Cardiff Oil-Ships Contract, 188
Chamber of Shipping, New President, 217
Clyde Activities, 15, 55, 73, 101, 160, 189, 251, 305, 357, 382, 491, 519, 597, 623
Coal-Fired Cross-Channel Steamship, G.W.R., 519
"Conte di Savoia," Gibraltar–New York Passage, 650
Ferry Boats, Coal-Tar Fuelled, 46
Launches and Trial Trips, 44, 218, 410, 434, 544, 622, 704
London–Boulogne Steamship Services, 10
Machinery Output, Marine, 1932, 22, 44, 69
Nanking–Pukow Train Ferry, 680
Oil-Fuel Cross-Channel Steamship, G.W.R., 45
Scottish Shipbuilding, 15, 44, 73, 101, 160, 189, 251, 305, 357, 382, 491, 519, 597, 623
Shipbuilding in 1932, 24, 45, 101
Shipping Guide, Handy, 73
South Wales Ship-Repairing Conditions, 14, 73, 101, 161
Stabilisation of Ships, Gyroscopic, *Erratum*, 598
Steamer, Coal-Burning, New, G.W.R., 596
Turbo-Electric Propulsion, 25th Anniversary, 520
Welsh Cargo Vessel Contract, 161
Welsh Ship Model Exhibition, 188
Welsh Shipping, Tonnage Decline, 251

Societies. See *Technical* and *Trade*

Strikes. See *Trade Societies*

Technical Societies, &c. :
Aeronautical Society, Royal, 430
British Association, 513
British Science Guild, 596, 678
Chemical Industry, Society of, 582
Congrès et Exposition du Chauffage Industriel, 706
Electrical Engineers, Institution of, 124, 435, 498, 519, 536, 596, 622, 637, 679, 706
Engineers and Shipbuilders in Scotland, Institution of, 99
Ex-Siemens Men, Association of, 260
Faraday House Old Students' Association, 189
Finsbury Technical College, Old Students' Association, 15, 416
Foundrymen, British, Institute of, 545
Fuel, Institute of, 678
German Circle, Engineers', 44, 364, 373, 515
Glass Convention, 462
Glass Technology, Society of, 463, 678
Heating and Ventilating Engineers, Institution of, 204, 622
Iron and Steel Institute, 188, 282
Junior Institution of Engineers, 9
Locomotive Engineers, Institution of, 596
Manchester Associated Engineers, 490
Manchester Engineers' Club, 499

Technical Societies, &c.—*continued*
Marine Engineers, Institute of, 430
Mechanical Engineers, Institution of, 66, 107 (*Erratum*), 519, 596 (*Erratum*)
Metals, Institute of, 110
Meteorological Society, Royal, 146
Mining Engineers, Institution of, 597
Mining and Metallurgy, Institution of, 464
Municipal and County Engineers, Institution, 570
Naval Architects, Institution of, 175
Newcomen Society, 571
Physics, Institute of, 428
Physical Society, 299, 423
Production Engineers, Institution of, Yorkshire Section, 146, 160
Safety Congress, National, 506
Sanitary Institute, Royal, 100
Structural Engineers, Institution of, 98, 178, 544, 561
Supervising Electrical Engineers, Association of, 44
Surveyors' Institution, Chartered, 673
Technology, Engineering, British Institute of, 170
Testing Materials, American Society for, 679
Transport, Institute of, 463, 587
Water Engineers, Institution of, 422
Waterworks Association, British, 462
Whitworth Society, 416
World Power Conference, 678

Telegraphy. See *Electricity*

Telephony. See *Electricity*

Tools. See *Machine and Other Tools*

Trade Societies, &c. :
Accidents, Industrial, U.S. Statistics, 514
Argentine, 8-Hour Day, Flexible Conditions, 366
Austria, Enforcement of Hours of Work Regulations, 366 ; Works Short-Time Benefit Scheme, 392 ; Strike Legislation, Terms of New Order, 603
Bedaux System, Hostility of Henry Hope's Employees, 673
Belgium, Belgian Employers on Adverse Effect of Changes in European Trade, 82 ; Overtime Permits, 313
Bevin, E., on the "Flexible" Wages Question, 10 ; on the Impracticable Demands of Correspondents, 458 ; on the Pension Question, 579 ; on the 40-Hour Week, 579 ; Opposition to Dictatorship, 603
Boilermakers' Society, Membership and Benefit Data, 228, 366, 458, 603 ; Mr. Hill on Hours and Production and Distribution of Wealth, 228 ; Bristol Channel Ships and Rota Demand, 491
Briggs Bodies, Ltd, Dagenham, Strike, 392
Bristol Channel Engineers and Shiprepairers' Association, Amended Agreement with Unions, 276
Building Industry, Wage Movements, 82, 553
Building Trade Operatives' Claims, 712
Bulgaria, Enforcement of Eight-Hour Day, 313
Canada, Unemployment Insurance Efforts, 366
Cleveland Blast-Furnacemen's Wages, 45, 409
Cleveland Ironstone Miners' Wages, 45
Communism, Trade Union Rejection of, 366, 392
Cotton Trade, Agreement, 10 ; Alleged Breaches of Agreement, 228 ; Conciliation Committees, Chairmanship Question, 127 ; Master Cotton Spinners, Proposed Week's Stoppage, 339 ; Weavers' Amalgamation, Rejection of Suggested Merger, 329 ; Northern Counties Textile Trades Federation and Legalisation of Agreements, 329 ; United Textile Workers and the 40-Hour Week ; 405, 579 ; Wages of Officials of Amalgamated Association, Ashton-under-Lyne Resolution, 276 ; Associated Textile Unions' Demands, 553 ; Textile Workers' National Union, Increased Wages Demand, 631
Cramp, C. T., on Socialism and the Common Good, 157
Czechoslovakia, Effects of Rationalisation on Various Industries, 127 ; Cotton Printers' Industry and the International Eight-Hour Day, 127 ; Chambers of Commerce, Opposition to 40-Hour Week, 127 ; Conditions of Dismissal for Manual Workers and Salaried Employers, 366 ; German Employers in Czechoslovakia and the 40-Hour Week, 579
Dagenham Strike, Briggs Bodies, Ltd., 392
Danzig, 48-Hour Week Amendment Order, 405
Denmark, Social Welfare Bill, 553
Electrical Contracting Industry, Wage Rate Variations, 392, 553 ; Notice to Terminate Cost-of-Living Agreement, 673
Electrical Industry, Stagnation in, 228
Electrical Trades Union, on Employment in 1932, 98 ; on the Failure of Electrical Engineering Prospects, 339, 458 ; on the Position of the Electric Railway Workers, 339 ; Trade Condition of, 458 ; Zoning Areas, 458 ; General Secretary's Re-election, 458 ; Unemployment Percentage, 553 ; Support of 40-Hour Week, 673
Electrical Trade Workers in Generating Stations, &c., A.E.U. on Wages Revision, 82
Employment Exchange Reports, 40, 98, 228, 276, 339, 392, 458, 514, 579, 646, 712
"Engineer," Professional Workers on Misuse of Term, 198
Engineering Industry, Labour Ministry's Annual Report, 127
Engineering and Shipbuilding Trades, Resolution on the 40-Hour Week, 431, 553, 571 ; Views of Employers' Federation on 40-Hour Week Claim, 431
Engineering Union, Amalgamated, Membership and Benefit Data, 82, 198, 313, 358, 553, 673 ; Generating Station and Substation Section, Wages Revision Question, 82 ; Election of Officers, 82, 127, 198 ; Ship Repairers and the One-Break System, 101 ; Comment on Opposition, at Prague Meeting, to 40-Hour Week, 198 ; on German Time-Saving Machines, 260 ; Discussion with Employers on Piece-Work Agreement, &c., 313 ; New President, 392, 431 ; Retirement of General Secretary, 431 ; Blackpool Meeting, 646 ; Mr. J. C. Little on Wider Distribution of Wealth for Emancipation of Workers, 646 ; Demand for Elevation of Status of Manual Workers and National Committee's Alternative, 646 ; on Establishment of 40-Hour Week, 646 ; Avoidance of Disputes (York Memorandum) Resolution, Defeat of, 646 ; Straight Piece-Work Resolution, 646 ; on Payment by Results, 646 ; Socialisation of Industry, 646 ; Welders, Ship, Details of Shipbuilding Employers' Federation's Proposed Terms, 673 ; General Secretaryship, Candidature for, 673
Factories, Government, Workers' Wage Claim, 392
Fascism, Trade Union Objection to, 366, 392
Ford Works, Dagenham, Partial Strike, 366 ; Terms of Settlement, 392
France, Overtime, Abuse of Exemptions, 82 ; Enforcement of Eight-Hour Day, 82 ; Salaried Employees, Protest against Competition of Pensioners, 157 ; Decree amending Eight-Hour Day Act Regulations, 228
General Federation of Trades, Membership and Finance, 198, 514, 646 ; Strikes, Official and Unofficial, Mr. Appleton's Counsel, 198 ; Mr. Appleton on Ill Effects of Rise in Prices, 514 ; Mr. Appleton on Impracticable Theories and Economic Exhaustion, 514 ; Mr. Appleton on the Fall in Trade Union Membership, Causes and Remedies, 646–647
General Workers, National Union of, on Increased Production and Reduced Wages, 631 ; Resolution favouring 40-Hour Working Week, 631 ; on Adverse Percentage of Organised Workers, 631
Geneva Conference, Hours of Work Discussion, 40 ; M. Jouhaux on French Claims for Reduction, 82 ; Mr. F. A. Norman's Exposition of Government Views, 82, 127 ; Mr. A. Hayday on Empire Workers' Position, 82 ; M. Gerard (Belgium) on Social Changes as affecting European Industry, 82 ; M. L. Ribot, Grounds of Opposition to 40-Hour Week, 98 ; Mr. F. Watson on Effect of Reduced Hours on High-Wage Countries, 98, 157 ; Mr. Bevin's Contention for Reduction of Hours and Wage-Maintenance, 98 ; Rejection of Labour Resolution and Adoption of that of Employers, 98 ; Summary of Conference Report, Arguments for and against Reduction of Hours, 127 ; Submission of Report to various Governments, 157
Geneva International Labour Conference. See *International Labour Conference* (below)
Germany, Unemployment Figures, 260, 646 ; Federation of Unions on Excess of 48-Hour Week, 296 ; Alien Labour, New Regulations, 276 ; Government Ban on Marxism and Socialist Unions, 313 ; Federation of Unions on their Future Aims, 405, 431 ; Industry Federation on Economic Reconstruction, 431 ; Employers' Federation on Harmonious Co-operation, 431 ; Federal Civil Servants, Prohibition of Subsidiary Occupations, 500 ; Trade Union System, Proposed Legislation, 553 ; Suppression of Employment Subsidies to Employers, 631 ; Civil Service Employees, New Orders, 631 ; German Labour Senate, Proposed, 631 ; Withdrawal of German Delegate from Labour Conference, 712 ; Collective Regulation of Working Conditions, 712
Holland, Zaandam Firms Favourable Experience of 40-Hour Week, 127 ; Overtime in Woollen Textile Factories, Conditions of Authorisation, 157
Hope, H., & Sons, Employers' Conditions for Return to Work, 673
Hours of Work, T.U.C. and International Reduction of Hours, 10 ; Machinists, International, on Reduced Hours as Remedy for Unemployment, 10, 198, 260 ; Spain, Probable Effect of Reducing Hours and Maintaining Wages, 10 ; Turkey and the Eight-Hour Day, 10 ; Geneva Conference, Hours of Work Discussion, Delegates, 40 ; French Workers' Claim for Reduced Hours and Wage Maintenance, 82 ; Mr. Norman on Interdependence of Hours and Wages, 82 ; Mr. Hayday on Reduction of Hours and Maintenance of Wages, and on the Collective Agreement Question, 82 ; Belgian Employers on Adverse Effect of Social Changes on European Trade, 82 ; Miners' Hours, International Conference on Ratification, 82 ; France, Overtime Abuses and Eight-Hour Day Enforcement, 82 ; Geneva Conference on Hours, Rejection of Labour Resolution and Adoption of that of Employers, 98 ; Geneva Conference, Summary of Arguments for and against Reduction of Hours, 127 ; Czechoslovakian Employers, Cotton Printing, and the International Eight-Hour Day, 127 ; Czechoslovakian Chambers of Commerce, Opposition to 40-Hour Week, 127 ; Netherlands Firm, Favourable Experience of 40-Hour Week, 127 ; National Trade Unions and the 40-Hour Week, 157 ; A.E.U. on Opposition to Reduced Hours, 198 ; Mr. J. Hill's Views, 228 ; Sir H. Betterton on Reduced Working Day and Absorption of Unemployed, 228, 366, 405 ; T.U.C. Consultation with British Unions on 40-Hour Week, 228 ; French Decree amending 8-Hour Day Act Regulations, 228 ; U. S. Machinists on Shorter Work-day and Week, 260 ; Italy, Temporary Extension of Hours Decree, 266 ; U.S. Working Hours and Maintenance of Wage Rate Question, 260 ; Japan, Bureau of Social Affairs and Overtime, 260 ; T.U.C. and Policy of Shorter Working Week in Engineering and Shipbuilding Trades, 276 ; Employers' Organisations and Unions and the 40-Hour Week, 276 ; German Unions on Excess of 40-Hour Week, 276 ; Belgium, Overtime Permits, 313 ; Poland, Enforcement of Hours Legislation, 313 ; Bulgaria, Enforcement of 8-Hour Day, 313 ; Japan, Tobacco Board's Reduction of Hours, 366 ; Austria, Enforcement of Regulations, 366 ; Argentina, Flexible Eight-Hour Day Conditions, 366 ; United Textile Workers and 40-Hour Week, 405, 579 ; Dansig, 40-Hour Week Amendment Order, 405 ; Engineering and Shipbuilding Trades, Resolution on 40-Hour Week, 431, 553, 571 ; Engineering and Shipbuilding Employers on 40-Hour Week Claim, 431 ; U.S. Sentiment in Favour of Shorter Working Week, 458 ; Scottish Trade Union Congress, Discussion on 40-Hour Week, 500 ; Poland, Infringement of Eight-Hour Day Case, 514 ; Railway Shopmen and the 40-Hour Week, 553 ; Bevan, E., on the 40-Hour Week, 579 ; Italy, National Corporation and the International 48-Hour Week, 579 ; Czechoslovakia, German Employers and the 48-Hour Week, 579 ; U.S., Black 30-Hour Week Bill, Machinists' Comments, 603 ; General Workers' Union, 40-Hour Week Resolution, 631 ; A.E.U. and the Establishment of 40-Hour Week, 646 ; Pattern Makers' Association, Support of 40-Hour Week, 673 ; Electrical Trades Union, Support of 40-Hour Week, 673 ; International Labour Conference, Geneva, Italian and British Government's Suggestions on 40-Hour Week, 673
Hunter, Sir J., on the Importance of the Skilled Labourer, 339
Imperial Chemical Industries, Restoration of Wages, 339
Independent Labour Party, Ownership and Control of Industry Claims, 431
Industrial Council, National, Suggested, 313
"Industrial and Labour Information," World Unemployment Statistics, 40, 405
Industrial Situation, 98, 127, 157, 228, 339, 458, 579, 712
Injuries, Slight, in Industry, Dangers of, 260
International Labour Conference on Public Works in Relief of Unemployment, 646 ; Discussion of 40-Hour Week, Italian and British Governments' Suggestions, 673 ; Withdrawal of German Delegate, 712 ; British Representative on Raising Working Class Conditions, 712
International Labour Organisation, on Unemployment Cost, Ratios of Wages Bills and Taxation, 10 ; Geneva Conference, Hours of Work Discussion, 40 ; Miners' Hours Conference at Geneva, 82
Ireland, Ulster Railwaymen's Strike, 127
Iron and Steel Industry, Rationalisation, 357
Iron Trades, Labour Ministry's Annual Report, 127
Iron Trade Wages, 131, 357, 597
Italy, Proposed Measures for Control of Industrial Development, 10 ; Hours of Work, Temporary Extension Decree, 260 ; Collective Agreements, Expiry Question 260 ; Bill to reduce Compensation for Dismissal of Highly-Paid Employees, 313 Mr. Olivetti on Japanese Competition in Industry, 366 ; Theoretical Discussion on Unemployment, by Senators Agnelli and Einaudi, 500 ; Industrial Accidents, New Compulsory Insurance Institute, 514 ; National Corporation and the International 48-Hour Week, 579 ; Fascist Inland Transport Undertakings and Agreements, Statistics, 631 ; Government and the 40-Hour Week Discussion at International Conference, 673
Japan, General Federation of Labour's Reform Aims, 198 ; Bureau of Social Affairs on Overtime, 260 ; Tobacco Board's Reduction of Working Hours, 366 ; Trades Union Congress on Withdrawal from League of Nations, 415 ; Imperial Gift to Labour Schools, 514
Johnson, T., on the Labour Party and Non-Valid Nostrums, 40
Labour, Displacement of, by New Methods, 10
Labour Ministry Reports, 40, 98, 127, 228 276, 339, 392, 458, 514, 579, 646, 712
Labour Notes, 10, 40, 82, 98, 127, 157, 198, 228, 260, 276, 313, 339, 366, 392, 405, 431, 458, 500, 514, 553, 579, 603, 631, 646, 673, 712
Labour Party, British Opposition to Dictatorship, Fascist or Communist, 366 ; on Non-Political Control of Industry, 366
Labour Programme, Non-Valid Nostrums in, 40
Living, Standard of, and "Flexible Wages, Mr. Bevan's Views, 10
London Omnibus Workers' Strike, 98
Machinists, International, on Reduced Hours of Work as Remedy for Unemployment, 10, 198, 260, 500 ; Support of Resolution that U.S. Navy be maintained 40 ; on "Misfits" and Unemployables in the United States, 127 ; on the U.S. Transportation Bill and Railway Employees, 712
"Man and Metal" on Displaced Labour in Iron, &c., Industry, 10
Miners' Federation on National Machinery for Co-ordination of Wages, 276 339, 631 Secretary on Irresponsible Strike Demands, 500, 631 ; on the Wage Rate Continuation Question, 553 ; Threat of National Strike, 631

Trade Societies, &c.—*continued.*

Miners' Hours, International Ratification Conference, 82
Miners' Welfare Fund, Welsh Contribution, 131
New Zealand, Apprenticeship Bill, 260
Offices, Hygienic Conditions in, 198
Omnibus Workers of London, Unofficial Strike, 98
Pattern Makers' Association, Unemployed Members, 82, 313, 458, 553, 673; Membership and Benefit Data, 458, 673; Support of 40-Hour Week, 673
Pension Question, Mr. Bevin's Views, 579; Mr. C. Clark's Statistics, 579
Poland, Enforcement of Legislation relating to Hours, 313; Infringement of Eight-Hour Day Case, 514
Post Office Workers, Wage-Increase Demand, 10; Conference, Wage Resolution, 514
Pottery Industry, Stabilisation of Wages, 157
Professional Workers, International, on Misuse of "Engineer," 198; on Hygienic Conditions in Offices, 198
Railways, British National Wages Board, Main Report on Labour Costs Reduction, 82; Findings of Railway Unions, 82; Unions' Acceptance of Report of N. W. B. Chairman, 98; Companies Objection to National Wages Board, 276; Railwaymen's adverse Comments on National Wages Board, 276
Railway Clerks' Conference, Alderman Simpson on the Wages Board Machinery, 603; National Transport Service Proposal, Adoption of Report, 603; Wage Resolution, 603
Railways, Electric, "J.R." on the position of the Workers, 339; Underground Railways and the 11s. per Week Demand, 455
Railways, Ireland, Great Southern, Settlement of Strike, 431
Railways, Ireland, North, Workers' Strike, 157, 313; Terms of Settlement, 405; Dail Comments on British Union Activities, 405
Railways, Roumanian, Effect on Employment of Miners of Use of Oil Fuel, 500
Railway Wages Question, Political Aspects of, 260
Railwaymen, Ulster, Strike against Wage Reductions, 127
Rationalisation, Community Burden, Sweden, 392; Effect in Various Industries in Czechoslovakia, 127; Iron and Steel Industry, 357
Roumanian Railways, Effect on Employment of Miners of Use of Oil Fuel, 500
Ruskin College Scholarships, T.U.C. Grant, 10; Successes of Students, 712
Russia, Power Station Development, 127; Passport System for Town Dwellers, 157;

Trade Societies, &c.—*continued.*

"Disorganisers of Production," Methods of Penalising, 198; Second Five-Year Plan Objectives, 276; Collective Farms—Machinery, Operation, Control and Protection, 392; Heavy Industries, New Regulating Orders, 405; Restriction on Mobility of Collective Farm Members, 431; Plan for Improved Industrial Efficiency, 712
Sainz, J., on Effect in Spain of reducing Hours of Work, but not Wages, 10
Scottish Trade Union Congress, Discussion on 40-Hour Week, 500; Demand for Repeal of Changes of Law in Trades Disputes Act, 500
Shipbuilding Employers' and Workmen's Conference on the Question of Displaced Workers in Redundant Shipyards, 198; T.U.C. and Trade Facilities Question, 260
Shipbuilding Industry, Labour Ministry's Annual Report, 127
Skilled Employment and Apprenticeship Association, 597
Skilled Labour, Sir John Hunter on Importance of, 339
Socialism, Mr. T. C. Cramp's Views, 157
South Africa, Industrial Calculation Amendment Act, 553
South Wales, Conciliation Board on Wages, &c., 10
Spain, Effect of Reducing Hours of Work but not Wages, 10; Bank Employees' Six-Hour Day, &c., Demands, 82
Stamp, Sir J., on Railway Wages, 260
Strikes, Mr. Appleton's Views and Counsel of Moderation, 198
Strike Statistics, 98, 228, 339, 458, 712
Swansea Sewer Works, Labour Difficulties, 491
Sweden, Rationalisation and Community Burden, 392
Tailors and Garment Workers' Union and Labour Research Department, 631
Technological Unemployment, M. Dalimier's Views, 82
Textile Workers, National Union, Increased Wages Demand, 631
Textile Workers' Union and 40-Hour Week, 405, 579; Sir Ben Turner's Hope, 603
Trades Councils' Demands and Call to T.U.C., 500
Trade Disputes Act, Scottish Trade Union Congress and Repeal, 500
Trade Union Congress and International Reduction of Hours of Work, 10; Grant for Ruskin College Scholarships, 10; Effect in Spain of Reduced Hours with Wages Maintained, 10; G. C. and Engineering and Shipbuilding Trades, Shorter Week Policy, 276; Opposition to Dictatorship, Fascist or Communist, 366, 392; on Non-Political Control of Industry, 366; New Medical Adviser, 392; on the Trade

Trade Societies, &c.—*continued.*

Union Movement in Germany, 405; Compulsory Workmen's Compensation Proposal, 514, 631; Committee Nominations, 514; Non-Recognition of Labour Research Department Statements, 631
Tramway Workers and the Temporary Wage Abatement, 98, 228
Transport and General Workers' Union, Mr. Bevin on Impracticable Demands of Correspondents, 458; Mr. Bevin on the Pension Question, 579; Mr. Bevin on the 40-Hour Working Week, 579; Mr. Bevin, Opposition to Dictatorship, 603; Finance, Benefits and Compensations, 712
Turkey and the Eight-Hour Day, Employers' Opposition, 10
Unemployment Insurance Benefit, Labour Ministry Reports, 40, 157, 276, 392, 514, 646
Unemployment Insurance (Expiring Enactments) Bill, 631
Unemployment, Ratios of Wages and Taxation, 10; I.L.O. Statistics of World Unemployment, 40, 405; U.S. Technological Committee's Report, Findings and Recommendations, 41; Technological Unemployment, M. Dalimier on, 82; Sir H. Betterton on Reduced Hours to absorb Unemployed, 228, 366, 405; U.S., Employers' Proposed Compulsory Insurance, 260; G.E. Co. (U.S.), Unemployment Insurance Proposal, 260; Technological Unemployment and Greater Use of Hand Labour, 366; American Machinists on Prime Need to Relieve Unemployment, 366; Canada, Efforts to Plan Unemployment Insurance Scheme, 366; Theoretical Discussion by Senators Agnelli and Einaudi, 500
Unemployment Reports, 40, 98, 127, 157, 228, 276, 392, 458, 514, 579, 646, 712
Unemployment Reports, Monthly Statistics, 40, 157, 228, 276, 392, 514, 646
United States, Metal Trades Convention, International Machinists on Maintenance of Navy, 40; Metal Trades, Proposed Governmental Boards to Investigate Grievances, 40; Metal Trades on Misemployment of Navy Personnel, 40; Taylor Society (N.Y.) on Ill Effects of Mass Production, Suggested Remedy, 41; Technological Unemployment, Committee's Findings and Recommendations, 41; B. C. Lewis on Unemployables or "Misfits" in the U.S., 127; Bureau of Labour Survey of Adoption of Five-Day Week, 157; Immigrant and Emigrant Figures, 198; Injuries in Industry, Small, Ill Effects of, 260; Bill banning Goods made by "Over Five-Day Week" Employers, 260; Shorter Workday and Week to Absorb Unemployed, 260; Mr. Aaron on Shorter Working Week as Essential to

Trade Societies, &c.—*continued.*

Civilisation, 260; Working Hours and Maintenance of Wage Rate Question, 260; Employers' Compulsory Unemployment Scheme, Suggested, 260; Engineers and Architects, Emergency Aid Scheme, 260; Bituminous Coal Industry, Employment Statistics and Effect of Mechanisation, 313; Accidents, Co-operation of Employer and Employed to Prevent, 366; Technological Unemployment and Greater Use of Hand Labour, 366; American Machinists, Primary Importance of Relief of Unemployment, 366; Miss Perkins on Interdependence of Wealth and Wage Earner's Health and Happiness, 431; Alien Immigrants and Finger-Prints, 458; Shorter Working Week, Favourable Trend of Sentiment, 458; Pennsylvania Labour Department on Industrial Homework and Violation of Labour Laws, 500; Bureau of Labour, Accident Statistics, 514; Excessive Commodity Production, Ill Effects and Suggested Remedies, 553; Temporary Character of Displacement of Labour by Power Machinery, 553; Brewing, New York Industrial Commissioner's Communication on Hazards of the Industry, 603; Black 30-Hour Week Bill, Machinists Comments, 603; Miss Perkins on Minimum Wage Law, 631
Wages, Fluctuation of, 98, 228, 339, 458, 579, 712
Wages, Mr. E. Bevin on "Flexible" Wages, 10; Wage Comparison, 1924–1932, 276
Welding, Electric, Details of Terms Proposed by Shipbuilding Employers' Federation for Ship Welders, 673
Welsh Miners' Notice to Terminate Contracts, 304, 313, 330, 357
Woodworkers, Amalgamated Society of, Unemployment, Sickness and Superannuation Expenditure, 647
Workmen's Compensation Insurance, Criticism of Administration, 366

Trade. See *Coal; Iron and Steel; Ships and Shipbuilding; Electricity; Industries*

Tramways :

Points, Tramway (Catalogue), 236

Turbines. See *Engines and Boilers*

Universities. See *Education*

Vehicles. See *Motor Cars; Railways*

Warships. See *Naval*

Waterworks :

Cardiff Reservoir Mishap, 491
South Africa, Steel Pipe Contract, 623

PATENT RECORD.

The Patent Index is classified under the following sub-titles:—ELECTRICAL APPARATUS; MINING, METALLURGY AND METAL WORKING; MISCELLANEOUS; MOTOR ROAD VEHICLES; RAILWAYS AND TRAMWAYS; AND STEAM ENGINES, BOILERS, EVAPORATORS, &C.

SUBJECT MATTER.

Electrical Apparatus :

Welding Rod. Quasi-Arc Co., Ltd., and A. P. Strohmenger, 450

Mining, Metallurgy and Metal-Working :

Furnace. Wellman Smith Owen Engineering Corporation, Ltd., and H. W. Soward, 718
Press, Power. Taylor & Challen, Ltd., and W. B. Challen, 450

Miscellaneous :

Expansion Sockets. N. Phillips, 450
Foundry Moulding Machine. British Insulated Cables, Ltd., and T. W. Bullock. 718

Motor Road Vehicles :

Brakes. Dennis Brothers, Ltd., and E. Poppe, 450
Clutch, Automatic. J. Stone & Co., Ltd., and E. C. Hatcher, 450

Railways and Tramways :

Coupling, Flexible, English Electric Co., Ltd., and F. Morris, 450

Steam Engines, Boilers, Evaporators, &c.:

Fusible Safety Plug. E. G. Hiller and the National Boiler and General Insurance Co., Ltd., 718
Tube Extractor. F. Squirrel, 718

NAMES OF PATENTEES.

British Insulated Cables, Ltd., and another. Foundry Moulding Machine, 718
Bullock, T. W., and others. Foundry Moulding Machine, 718
Challen, W. B., and others. Power Press, 450
Dennis Brothers, Ltd., and another. Brakes, 450
English Electric Co., Ltd., and another. Flexible Coupling, 450
Hatcher, E. C., and others. Automatic Clutch. 450
Hiller, E. G., and others. Fusible Safety Plug, 718
Morris, F., and others. Flexible Coupling, 450
National Boiler and General Insurance Co., Ltd., and another. Flexible Safety Plug, 718
Phillips, N. Expansion Sockets, 450
Poppe, E., and others. Brakes, 450
Quasi-Arc Co., Ltd., and another. Welding Rod, 450
Soward, H. W., and others. Furnace. 718
Squirrel, F., Tube Extractor, 718
Stone, J., & Co., Ltd., and another. Automatic Clutch, 450
Strohmenger, A. P., and others. Welding Rod, 450
Taylor & Challen, Ltd., and another. Power Press, 450
Wellman Smith Owen Corporation, Ltd., and another. Furnace, 718

LONDON:

Printed for the Proprietors by HARRISON & SONS, LTD., at the BEDFORD PRESS, 20 & 21, Bedfordbury, in the Parish of St. Martin's-in-the-Fields, and Published by ARTHUR ERNEST MAW, at the Offices of "ENGINEERING," 35 & 36, Bedford Street, in the Parish of St. Paul, Covent Garden, both in the County of Middlesex.—Friday, July 28, 1933.